The Veterinary Record, July 9th, 1960

AUG - 1
VET. MED. LIBRARY

Price 2s.

Vet Med

OHIO STATE UNIVERSITY
JUL 27 1960
L. . . . r

The Veterinary Record

PATRON: HER MAJESTY THE QUEEN

Vol. 72 No. 28 Issue No. 4285 547-568

Registered as a Newspaper

A NEW EAR WAX REMOVER—

and remedy for parasitic mange in dogs and cats

TRIBUTES FROM A FIELD TRIAL

- "especially useful because of its property of dissolving wax".
- "often no cleaning with forceps and wool was necessary".
- "This product has been found to be exceedingly good also in certain ear conditions not readily curable".
- "Two main types responded best, namely, parasitic mange and accumulation and hardening of wax secretion causing irritation".

**Vet. Rec. 1959, 71, 143*

CERUVET

(Trade Mark)

VETERINARY EAR DROPS

Particularly effective in parasitic mange and accumulation of hardened wax, especially in long-haired dogs.

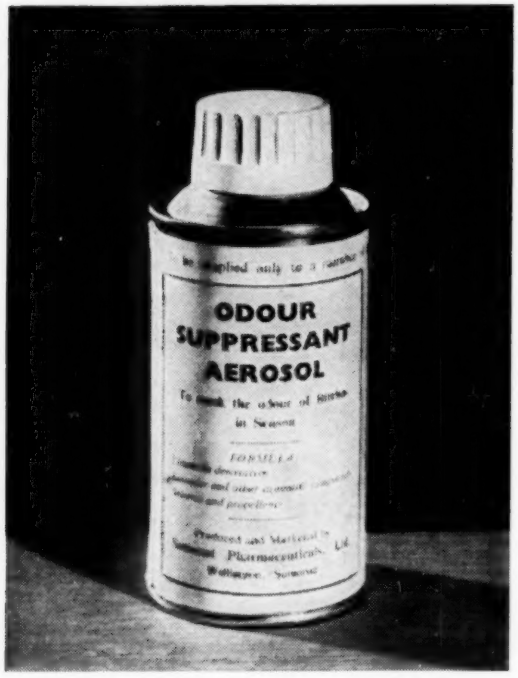
- **NO OTHER MEDICATION OR TREATMENT NECESSARY**
- **SAFE—NON-IRRITATING—ANTI-BACTERIAL**
- **EASILY APPLIED—HARMLESS TO THE LINING OF THE EAR**

Supplied in 14 ml. vials with dropper

Literature gladly sent on request

LABORATORIES FOR APPLIED BIOLOGY LTD.

91, AMHURST PARK, LONDON, N.16 TELEPHONE: STAmford Hill 2252/3



ECTOPARASITE AEROSOL for the destruction of lice, fleas and other ectoparasites on small and large animals. Does not stain fleece or fur.

142 gm. units in cases of 6 and 12.

AEROSOL 1053—an efficient combination of insecticidal and deodorising materials.

142 gm. units in cases of 6 and 12.

ODOUR SUPPRESSANT AEROSOL—to mask the odour of bitches in season.

142 gm. units in cases of 6 and 12.

CHLORAMPHENICOL AEROSOL—for the treatment of foot-rot in sheep.

114 gm. units in cases of 6 and 12.

SOMERSET PHARMACEUTICALS LTD

WELLINGTON, SOMERSET—*Phone:* **Wellington, Som. 2244**

THE VETERINARY RECORD

Founded by William Hunting, F.R.C.V.S., in 1888

Volume 72
No. 28

SATURDAY, JULY 9th, 1960

7 Mansfield Street,
London, W.1.
Museum 6541

Extra Salary Increments for Higher Qualifications: Anomalies in the Colonial Service

AS a result of recommendations from its Overseas Committee the British Veterinary Association has, on several occasions, been in official communication with the Secretary of State for the Colonies in the hope of removing certain vexatious—and unfair—anomalies which exist between veterinary and medical officers. One of these, of which several examples have come before the Overseas Committee, concerns the grant of advance increments in recognition of qualifications extra to membership of the Royal College of Veterinary Surgeons. Veterinary surgeons in the Colonial Service have been refused these on the grounds that they gained their post-graduate higher qualifications *after* joining the Service. The absurdity of this ruling is sharpened to justifiable grievance when it is realised that no such condition applies to post-graduate medical officers. They are awarded such advance increments, it is said, as an encouragement to recruitment.

At the present time we understand that there are over 40 unfilled veterinary posts in the Colonial Service. They are likely to remain empty if the Minister continues to allow such discrimination between members of one profession and those of another.

In official circles a popular device is to take refuge behind the undesirability of creating precedents ; but this has been met in advance by our Association's suggestion that the claims made by veterinary officers should be restricted to those holding identical or, exactly comparable, higher degrees to those of their medical colleagues. At present the inequitable situation exists that, in any given territory under the aegis of the Colonial Office, a veterinarian holding the Diploma in Bacteriology is 4 increments behind a medical doctor working side by side with him having the same qualification.

Another inequality is that regarding specialists who wish to remain within their own disciplines rather than accept promotion to higher administrative posts. In the medical field such specialists are, rightly, awarded increments which justify them in remaining in the Service and providing the benefit of their specialised knowledge. In the past such valuable workers resigned to seek more lucrative employment elsewhere, but now, even though tardily perhaps, the importance of retaining them is accepted. No such concessions are available to veterinary officers ; and though it may be argued that there are fewer specialists within our own ranks than in those of the sister profession, there surely has never been a time when developing and expanding overseas communities were more in need of the most accomplished veterinarians they could obtain.

Only one overseas Government has so far seen the sense—to say nothing of the justice—of this contention. Even there the conditions necessary to obtain the specialist increment are, to say the least, exacting. An officer is eligible only if : he has reached or will reach within 1 year the maximum of the "A" scale ; he holds a post of a scientific or specialist nature ; prospects of promotion in the administrative field are denied to the holder ; he has the minimum qualification laid down for the post ; he is outstanding in the performance of his duties, and if no repercussions are likely with officers in other Departments.

It hardly needs to be pointed out that the last condition may well make any question of increment impossible.

The evolution of native peoples towards self government is so rapid in these days that it may be the Colonial office will cease to exist within a measureable time. But these discouragements to recruitment —to put it no higher—are not simply the concern of one Ministry or of one obdurate body of civil servants. Expanding populations and the justifiable demand for better standards of living demand veterinary services sufficient in numbers of personnel and high in quality. Such grievances as these quoted here are not calculated to secure them, especially at a time when the profession at home is fully extended to meet

(*Concluded at foot of page overleaf*)

Spontaneous Diabetes Mellitus*

BY

J. S. WILKINSON

Chemical Pathology Division, Department of Pathology,
Royal Veterinary College, London

SUMMARY.—An account is given of spontaneous diabetes mellitus encountered in 56 dogs and 2 cats in the period 1956-8 with special reference to clinical features, treatment and macroscopic post-mortem *findings. Factors affecting the onset of the disease, particularly oestrum in the female, are indicated.*

Introduction

IN dogs, chronic nephritis, "closed pyometra" and diabetes mellitus all show great similarity in their clinical pictures, being wasting diseases associated with polydipsia and polyuria and in the later stages with vomition. Pyometritis and diabetes also show a marked similarity in their time relationship with oestrus.

The likelihood of misdiagnosis of diabetes mellitus in the absence of adequate urine examination, the apparently low incidence of the disease and the opportunity to study 2 cases presented almost simultaneously stimulated the author's interest in this disease.

Search in the literature revealed references dealing with over 150 cases in small animals of which a review has been published (Wilkinson, 1957). Clinical histories, regimes of treatment or *post-mortem* reports were frequently lacking and many points were not clarified and it was hoped that a fairly detailed study would lead to a better understanding of the disease and possibly to some insight into its aetiology.

This article is the result of a survey of 58 cases (in 56 dogs and 2 cats), seen between 1956 and 1958; of these, 24 cases were diagnosed at the Beaumont Animals' Hospital, 24 were sent for second opinion and 10 were diagnosed elsewhere and sent to the Pathology Department for *post-mortem* examination. The figures given throughout refer to the cases seen in dogs.

* A paper presented to a meeting of the Central Veterinary Society on February 4th, 1960.

Clinical Picture

Numerical Incidence (Beaumont Hospital)

One of the most important facts that arose from this study is the indication that the disease may be

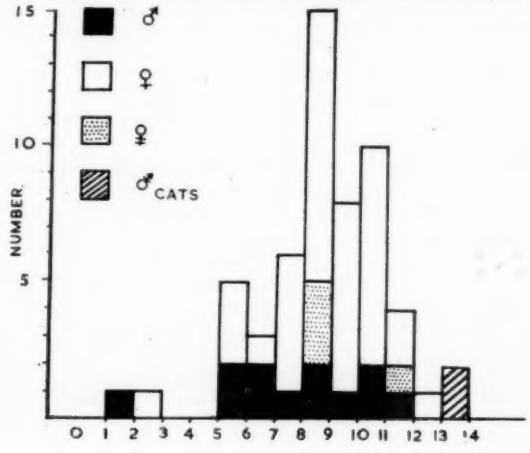


FIG. I.—Age and sex incidence.

Extra Salary Increments for Higher Qualifications.—*Concluded.*

the demands made upon it, and every new graduate may choose from among a dozen principals each in urgent need of his or her services.

We are gratified to learn that the Secretary of State for the Colonies recognise that there is some anomaly in medical officers with specialist qualifications receiving additional increments while veterinary officers, who may possess the same qualifications, do not. We are informed that the salaries commission which is shortly to enquire into conditions of service in the East African territories will be invited to consider this question.

For veterinary surgeons the Colonial Service has been, and must always be, a vocation of high endeavour, but ideals must not be made the convenient substitute for fair play. Pie in the sky is of romantic origin—but it is wanting in nutrition.

far commoner than is generally appreciated. In 1956 and 1957 the incidence was 1:260 and 1:170 respectively though in 1958 it dropped to approximately 1:2,000.

Age and Sex Incidence (see Fig. 1).

The age and sex incidences correspond closely to those previously reported (Wilkinson). (Twice as many females developed the disease as did dogs, and the majority of cases occurred between 5 and 12 years, with a marked peak between 8 and 9 years.) In this series there were 39 females, 12 males and 5 neutered females.

Breed Incidence

Of the 56 dogs no fewer than 17 were Dachshunds, 15 were mongrels, and other breeds represented were Poodles (5), Spaniels (5), Cairn Terriers (3), Foxterriers (3), Collies (2), Setters (2), Corgi (1), Scottish Terrier (1), Samoyed (1), and Keeshond (1).

History and Clinical Findings

This survey has emphasised the relevance of oestrum, pseudopregnancy and stress in the onset of the disease and has brought out the importance of early diagnosis and prompt commencement of treatment.

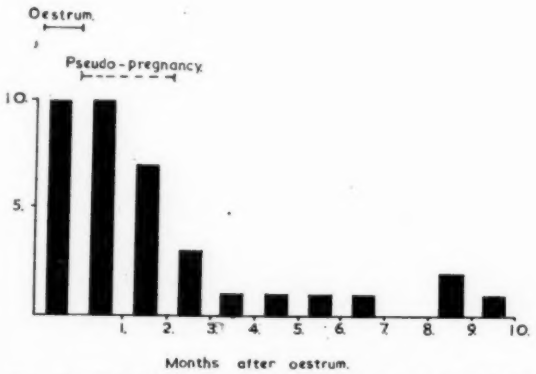


FIG. II.—Relationship between the oestrous cycle and the onset of the signs of the disease.

The time relationship between oestrum, pregnancy or pseudopregnancy and the onset of signs of diabetes is shown in Fig. 2. This histogram also includes those cases in which the insulin requirements increased during oestrum. (This increase in insulin requirement is not invariable, one bitch has successfully achieved 4 cycles without requiring a change in dose.) Unfortunately, the significance of the stage of the cycle was not appreciated at the beginning of the survey and this information is missing from a number of case reports.

It is possible that those cases in which the signs were first noticed by the owners 4 to 6 months after oestrum did in fact develop the disease earlier. This theory is supported by 2 cases. The owners of both animals were convinced that their pets were quite fit but both showed ketonuria.

Of those cases developing symptoms 7 to 10 months after the last noted oestrum, the 7-month case had normal, quiescent ovaries suggesting that 7 months was a true estimate; the 10-month case also showed normal quiescent ovaries and in this case it may be postulated that the bitch had successfully concealed the pro-oestral bleeding 4 months earlier. In the two 9-month cases the ovaries were recorded as normal but the stage of the cycle was not noted. It may very tentatively be suggested that these cases are allied to the 10-month case in that the bleeding may have been concealed. It is possible that this effect of oestrum is a non-specific one of stress. This is a difficult factor to assess accurately in small-animal disease but psychogenic, surgical, infectious and pregnancy stress factors have all been noted to occur shortly before the onset of the disease.

The important clinical signs are given in the following Table:—

TABLE I

Sign	Number of cases
Polydipsia	55
Polyuria	50
Loss of weight	44
Cataracts (varying from earliest signs to complete opacity)	38
Vomiting	24
Skin Lesions*	20
Urinary incontinence	18
Diarrhoea	11
Increased appetite	7
Anorexia	7

* (These lesions include interdigital cysts, furunculosis, general and local depilation, dermatitis, seborrhoea, hyperkeratosis, abscesses and frictional acanthosis. Three cases of conjunctivitis and one of otitis externa are also included.)

None of these dogs showed any overt signs of a pancreatitis or exocrine pancreatic dysfunction though routine faecal fat and trypsin estimations were not performed.

A pendulous abdomen due to loss of muscular tone, palpable enlargement of the liver, easy fatigue and pale mucous membranes were also noted in a few cases.

Diagnosis

A provisional diagnosis of diabetes mellitus was made in any case which showed glycosuria whether the clinical picture was typical or not. This diagnosis was confirmed if glucose was present in a second sample or if the fasting blood glucose level was raised. In the later stages of the survey the presence of ketones in the urine as well as glucose was considered diagnostic.

It is worthwhile noting here that in no case was the provisional diagnosis not confirmed. In the author's opinion glycosuria of origins other than diabetes is so rare as to present no serious differential diagnostic problem. However, it must be emphasised that not all reactions with Benedict's test are due to glucose. "Trace" or "one plus" reactions due to glucuronides are frequent and it is important to demonstrate that the reducing substance is, in fact, glucose before diagnosing diabetes mellitus.

Similarly there is no satisfactory clinical evidence

that ketonuria occurs in the dog in conditions other than diabetes. Ketonuria may, therefore, be considered as an adequate confirmation and perhaps more important still, as an indication that insulin treatment should be instituted without further delay.

A diagnosis can also be made on *post-mortem* examination, a very fatty liver is suggestive of diabetes mellitus and the diagnosis can be confirmed by testing the urine or by blood sugar estimation provided that the patient had not been fed within 8 hours of death and the blood sample obtained within a few minutes of death.

Diagnoses in this survey were, therefore, based on (i) clinical picture and glycosuria (11 cases), (ii) clinical picture, glycosuria and ketonuria (42 cases), (iii) clinical picture and hyperglycaemia (1 case), (iv) glycosuria alone (1 case), (v) *post-mortem* findings and hyperglycaemia (1 case).

The case diagnosed on glycosuria alone showed no evidence of ill-health and was discovered on a routine urine test. It was found difficult to persuade the owner that her pet was in fact ill. In 2 cases it was impossible to confirm the diagnosis on urine examination. One bitch belonged to a blind man who could not collect a sample; the diagnosis was made on a raised fasting blood glucose level. The second case died while being examined: a *post-mortem* examination was performed immediately and a sample of blood was obtained within 5 minutes of death when the very fatty liver was observed.

Differential Diagnosis

It has already been mentioned that diabetes can, on clinical signs and history, be readily confused with chronic nephritis and pyometritis. However, after glucose has been demonstrated in the urine no serious differential diagnostic problems have arisen.

It must, however, be emphasised that the presence of diabetes mellitus does not exclude the possibility of a co-existent nephritis or pyometritis or both. Certainly the former was present in a number of cases in this series and pyometritis was a complicating factor in at least 2 bitches, in 1 of which there was also a nephritis.

Diagnostic Methods

The urine tests described by Harvey (1957) were most frequently used in diagnosis though the proprietary tablet tests (Hoe & Wilkinson, 1958) were found satisfactory particularly for day-to-day checking.

Enzyme test papers and chromatography were used to confirm the presence of glucose in the urine but the test papers were found unsatisfactory for quantitative estimation of glucose in urine, blood or tears (Stratton & Wilkinson, 1959).

Blood sugar was estimated by Lee's (1954) method, the screening technique (Wilkinson & Harvey, 1958), or the method of Hagedorn and Jensen. Blood urea was estimated by the screening technique (Wilkinson & Harvey). The results of blood sugar estimations are given in Table II.

TABLE II

Blood Glucose Level (mg. per 100 ml.)	Number of Cases
100-200	7
201-300	19
301-400	6
401-500	2
Over 500 (560, 570, 660, 750 (2), 1,250) ...	6

Urine Examination

Ideally urine should be examined for all major pathological changes, particularly when the patient is examined for the first time. Such an examination can give valuable information concerning the severity of the disease (glucose concentration and degree of ketonuria), the prognosis (presence of serious renal or hepatic dysfunction), and of concomitant conditions such as cystitis.

Physical Characteristics

Specific gravity. Of the routine tests specific gravity is of the least value in the diagnosis of diabetes. There is no regular correlation between the concentration of glucose and the specific gravity of a sample since the specific gravity depends on the availability of water and the degree of renal function. Figures as low as 1.005 (with a glucose concentration of 2.4 g. per 100 ml.) and as high as 1.060 (with glucose concentrations of 3 g. and 12 g. per 100 ml.) have been recorded.

Reaction. Normal urine varies between *p*H 5.5 and *p*H 7 and even in the most severe cases of acidosis, due to excessive ketone production, the *p*H never fell below the normal lower limit. While all the cases in this survey were within this normal range when first examined, cystitis was diagnosed in a case under treatment when the *p*H increased to 8.5.

Chemical Constituents

Glucose. As mentioned previously the concentration of glucose will depend to a certain extent upon the degree of hydration. For investigational purposes only 24-hour samples of urine serve any purpose but this is usually impracticable under field conditions and multiple samples are satisfactory provided that consistency is maintained in time of feeding, sampling and injection.

The figures obtained for glucose in this series varied from 0.5 g. per 100 ml. to 12 g. per 100 ml. (See Table III.)

TABLE III
BENEDICT'S QUANTITATIVE METHOD AND CLINITEST

Glucose g. per 100 ml.	Number of Cases
Under 1.0	3
1.0-2.0	6
2.0-3.0	4
3.0-4.0	9
4.0-5.0	4
Over 5.0 (5.5, 6.3, 7.0, 7.2, 8.0, 10.0, 12.0) ...	10
Clinitest figures "over 2 per cent." ...	9

Benedict's Qualitative Test

One plus	1
Two plus	1
Three plus and over	9

No urine was available for examination from 2 cases and diagnosis was confirmed on the blood glucose levels.

Ketone bodies. Ketonuria was present in 42 cases (see Table IV).

TABLE IV

Reaction	Number of Cases
One plus	12
Two plus	7
Three plus	9
Four plus	12
Degree unknown	5

Protein. In this series clinical nephritis, as indicated by proteinuria, was present in 25 cases. Sixteen cases showed no protein and no information is available concerning the rest. There appeared to be no correlation between the severity of the diabetes and the degree of proteinuria but the presence of protein will affect the prognosis.

Bilirubin. In this series bilirubin was rarely detected being present in only 2 cases when first examined: 2 other cases developed severe terminal bilirubinuria.

Prognosis

The prognosis is very grave in cases showing marked bilirubinuria, and none of these have responded to treatment. It appears to be very grave also in untreated cases that have developed ketonuria but rather more favourable in those showing glycosuria alone. It is affected by the presence and severity of renal and hepatic disease and also by the age of the patient. However, once stabilisation is achieved and if the owner is prepared to co-operate, the patient's life should be appreciably prolonged.

Treatment

The criteria chosen for satisfactory stabilisation were:—

(1) Urine free from ketones,

(2) urine containing not more than 0.5 per cent. of glucose, and

(3) blood glucose values not higher than 200 mg. per 100 ml.

Of these, only the first was considered indispensable: if the stricter control necessary to produce the latter two was irksome to the patient or inconvenient for the owner higher values were allowed. It was possible in some cases to keep the urine sugar-free for months at a time but in others a permanent glycosuria was necessary to prevent hypoglycaemic crises.

As soon as the diagnosis was confirmed the patient was placed on a high protein, low fat, low carbohydrate diet. In those cases in which there was no ketosis, diet alone was tried and in all there was a marked improvement in the dog's well-being. In 2 cases diet alone was sufficient to prevent glycosuria.

In view of the average dog's conservative attitude towards his food, a high fat diet as suggested by Maignon (1911) was not given.

Subcutaneous insulin was given if there was more than a one plus reaction for ketones or if the glycosuria persisted for 2 or 3 days on diet. Insulin Zinc Suspension (Lente) was found to give the most satisfactory results. No fixed dose was chosen and the conservatively small doses given to the first cases may have accounted for the apparent lack of response in some of the more severe ones. Crystalline insulin was used intravenously in cases of severe ketosis and subcutaneously in less severe cases and prior to surgery.

The maintenance dose varied considerably, from 10 units daily for a Dachshund to 80 units twice daily for a Collie on heat. The majority of cases required between 20 and 40 units. In some cases it was found necessary to decrease the dose as the degree of ketonuria fell and in many there has been a slow increase in the maintenance dose.

It has not been found possible in any of the cases treated by the author to stop insulin once it has been started. One case, however, that was sent for *post-mortem* examination had required insulin during the last 10 days of pregnancy and for 4 days after parturition but thereafter none was needed until she became severely diabetic at the next oestrum, when she was destroyed.

Another case, not included in the survey, has been satisfactorily stabilised with injections twice weekly.

It is preferable for a number of reasons to admit a diabetic patient to kennels for stabilisation though this may have its disadvantages. A number of cases deteriorate very rapidly after admission (this may have been coincidental since some cases that were not admitted showed a similar rapid deterioration). There is little doubt that some dogs are very distressed in kennels and patients that were known to fret were not admitted and any that were obviously not settling down were discharged and treated at home.

Only a few of the cases showed any indication of systemic disease when first examined but many developed diarrhoea after admission. Whether this was due to an intercurrent infection or due to the sudden change in food is uncertain. If it persisted sulphaguanidine was given.

In view of the diabetic's decreased resistance to secondary infection penicillin was given prophylactically in most cases.

The routine use of vitamin B_{12} was indicated by the frequency of liver changes found on *post-mortem* examination and the anaemia reported by Smith (1946), and the work of Biskind and Schreier (1945) suggested that massive doses of the B complex might be beneficial. These were tried in some cases but as they did not produce any obvious improvement in the dog's condition it is impossible to assess to what degree they were effective.

Any purulent conjunctivitis or infected skin lesions were treated locally with antibiotics and responded well.

There is some doubt about the necessity and usefulness of lipotropic agents in the treatment of diabetes. If the disease is due to a destructive lesion of the pancreas and the exocrine function is affected, they are doubtless necessary but since many cases show no evidence of exocrine dysfunction, either

clinically or on *post-mortem* examination, there should be no lack of endogenous lipotropic agents. As the evidence on this point was controversial a proprietary lipotropic compound was given in some cases where it was felt that liver fat was very high due to the ketosis. Again it was not possible to assess the value of this treatment. Owners were advised to feed at least one egg weekly to provide lecithin.

Oral Hypoglycaemic Agents

These drugs have been hailed as the last word in treatment of diabetes both in man and in the dog. Unfortunately this claim has been made on experimental work and is not supported by clinical experience (Davidson, Haas & Connor, 1957).

Niemand (1956) records unsuccessful attempts to treat diabetes with these drugs in 3 cases, 1 of which died as a result of the change-over from insulin. Garbers (1957) was similarly unsuccessful.

In 2 cases this method of treatment had been used without success prior to admission. Of the other 4 cases in which it was used unsuccessfully, 2 were first treated with insulin until their ketosis was controlled, 1 had a very mild ketonuria when treated, and 1 had been treated by diet alone with no ketonuria.

One- to 2-g. doses of 1 butyl 3-*p*-tolyl-sulphonyl urea* were given at 12-hourly intervals until the ketonuria returned or until it became obvious that the urinary glucose was not going to fall.

The fifth case was diagnosed relatively early; the urine, which was sugar-free after a 48-hour fast, showed a heavy glycosuria 6 hours after feeding but there was no ketonuria. Oral hypoglycaemic therapy (1.5 g. per day) was started without previous insulin and over a period of 10 days the glycosuria gradually dropped to 0.5 per cent. and has remained at about this level since.

It appears, therefore, that in the dog, as in man, no success can be expected with these drugs where there is, or has been, ketonuria or if the blood glucose is more than slightly raised (Butterfield, Kelsey Fry, Hardwick & Holling, 1957; Walker, Slater, Westlake & Nabarro, 1957; Crowley, Wolff & Bloom, 1957).

If it is particularly desirable to use this method of treatment some degree of glycosuria is permissible. However, if ketonuria develops, insulin must be given or the animal will later have to be destroyed.

Severe Ketosis

While the majority of cases responded well to treatment by diet, insulin and supportive therapy there remained the occasional intractable case. Such cases presented typical signs of diabetes and even appeared in better health, initially, than some which responded well. Little response to subcutaneous insulin (in the doses given in this series) was obtained within 8 hours, and the patient became rapidly worse with frequent vomition, increasing lethargy, coma and eventually death within 6 hours of collapse. The condition appeared to be associated with anuria and liver dysfunction though without further investigation into blood chemistry this cannot be proven.

* Tolbutamide.

Treatment was aimed at correcting the dehydration and electrolyte loss (much sodium and potassium is lost with the keto-acids and in the vomitus) and restoring glucose metabolism. Glucose saline was given orally, by stomach tube if necessary, subcutaneously and intravenously, care being taken not to overload the cardiovascular system. Up to 40 units of crystalline insulin were given intravenously and subcutaneously. (It seems likely, in view of the ketosed patients known resistance to insulin, that much larger doses should have been given.) In some cases potassium citrate was given orally and in all penicillin was given parenterally.

Persistent vomiting is a feature of some cases of ketosis. It prolongs the time taken to rehydrate the patient and it was felt that the sooner it was overcome the more rapidly would the patient recover. Capsules of chloretone and belladonna were given where it was thought advisable and appeared to be useful in some cases though results were variable.

Maintenance at Home

Owners who could be relied upon to perform the tests regularly were encouraged to use the proprietary urine testing tablets for glucose and acetone. In some cases they were advised to make small alterations in the dose of insulin on the results of the test but it was stipulated that advice should be sought if any sudden change occurred.

Complications and Developments

Hypoglycaemia

This may arise from an inadvertent overdose of insulin or from a refusal to eat. It is manifested by muscle tremors, inco-ordination, circling, defaecation, micturition, occasionally profuse salivation and finally coma.

Recovery is very rapid following the administration of glucose given either orally or intravenously depending on the severity of the condition. Adrenaline was used in one case only and that without apparent success. The case was, however, abnormal and the prolonged "coma" was possibly primarily central nervous in origin. The liver showed 64 per cent. fat and there was possibly little or no glycogen to mobilise.

Cataracts

It is sometimes impossible to decide whether the cataracts are due to diabetes or to old age. Adequate stabilisation may retard the further development of diabetic cataracts but has not, in this series, resolved any opacity that had developed before treatment was started.

In 2 cases in which it was decided to extract lenses the dogs were stabilised before surgery was attempted. Food and water were withheld on the morning of the operation and the normal dose of insulin given, half as crystalline and half as a long-acting form. In 1 case the pentothal-potentiating action of insulin was very marked, the dog requiring only about a third of the normal dose for induction.

(Since this survey was carried out lens extractions have been performed satisfactorily on 3 diabetic dogs.)

Diabetic Coma

It appears that the dog is less liable than man to develop ketotic coma and it has been found in this series that if true coma develops no treatment will save the patient's life. Unlike man, where coma may persist for some time, those cases in which it did develop invariably died, or, if not destroyed, would probably have died within 6 hours. This difference between dog and man is possibly due to a better tolerance of the metabolic disturbances in the dog.

Exercise

Owners were advised to ensure that the energy expended daily on walks was kept as uniform as possible.

Oestrum

It was found particularly important to examine urine frequently and regularly during oestrum and pseudopregnancy. Unless this was done severe ketosis developed in some cases before the owners realised that the patients' condition had deteriorated.

Outcome

Of the 58 cases 13 were living when this paper was prepared. Of the remainder, 7 died or were destroyed for reasons not associated with diabetes and 8 were destroyed at their owner's request either before treatment was commenced or later. Eighteen cases were severely ill when first seen and died in spite of treatment, and the remainder were destroyed when it was obvious that the prognosis was hopeless. In the absence of more detailed serum electrolyte studies the immediate cause of death is speculative but in some cases high urea levels, anuria and terminal signs indicated that renal failure was involved. Terminal bilirubinuria in 2 cases, one with jaundice, and the very marked liver changes found on *post-mortem* examination, suggest that liver failure also contributed. In one case there was evidence of a meningeal haemorrhage and raised intra-cranial pressure.

It is too early yet to assess the average length of life after diagnosis but Table V gives some indication.

TABLE V

Length of Life after Diagnosis (Months)	Treatment	No. of Cases
27	Diet alone	2
24	Diet and insulin	1
21	Diet and oral hypoglycaemic agent	1
21	Diet and insulin	3
15-20	Diet and insulin	4
12-14	Diet an insulin	3

Pathology

Macroscopic Pathological Changes

Post-mortem examinations were carried out on 36 cases.

The only regular finding was a very fatty liver (fat content 30 to 78 per cent. of the dry weight): this was found in all cases that died in ketosis but was absent from those cases whose death was not associated with ketosis. Gross pancreatic changes were confined to 1 case only in which there was no recognisable pancreatic tissue; a further 3 cases showed omental adhesions to the pancreas, the underlying gland appearing normal, and a fifth case showed marked diminution in the width of the gland which was otherwise apparently normal.

Nephritic changes were noted in 15 cases.

The endocrine system showed very few changes, one case showed enlargement of the lateral lobes of the pituitary and reduction in the adrenal cortex: medulla ratio. Adrenal nodular hypertrophy did not appear to be more frequent than normal but 2 cases showed apparent cortical neoplasia. The thyroids, parathyroids and testes showed no pertinent changes and the ovarian findings were only significant in their relation to oestrum. Atherosclerosis, a small plaque at the root of the aorta, was noted in 1 case only.

Discussion

Any clinical survey of this kind is hampered by the lack of a satisfactory scheme for the registration of dogs. There is no reliable figure for the total dog population of the country or their average age or age at death.

Even less information is available for cats since licences are not required and there is a large feral population.

There can be little doubt that there has been an increase in the incidence of the disease in the past 50 years. This increase may be real or it may only be apparent.

Incidence is affected by:—

(1) The number of dogs which live to the "peak" age,

(2) better investigations and, therefore, more accurate diagnosis,

(3) a real increase in the number of cases developing,

(4) the attitude of owners towards veterinary care.

There can be little doubt that the high incidence at the Beaumont Hospital during 1956 and 1957 is at least partly accounted for by increased attention to urine analysis, but it is difficult to explain the sudden decline in incidence in 1958. The Chi-squared test showed that there was no significant seasonal variation over the whole series.

The incidence in cats, only 1 case diagnosed in 4 years, is much lower than the 1: 1,500 recorded by Bloom and does not correspond with the findings of Holzworth and Coffin (1953) ("commoner in cats than in dogs") and Joshua (1955) who finds the condition not uncommon in elderly cats.

There can be no doubt that in the dog there is a significantly higher incidence in females than in males though the picture is different in the cat where the neutered male appears to be more prone to the disease. (In dogs, Sholl and Sales (1957) record that over 95 per cent. of their series were females; the overall figure is 65 per cent. and in this series the figure is 69 per cent.)

In spite of Groen's (1958) theory (*vide infra*) this high incidence indicates that the cyclical hormonal

changes that occur in the female must inevitably be implicated in the aetiology. However, Groen's theory may be adopted to support the apparently higher incidence in castrated male cats. There is one major difference between the wild and the domesticated bitch in that while in the wild state pregnancy is the rule rather than the exception, in the domesticated animal the reverse is true. Certainly the majority of the bitches in this survey were nulliparous, and possibly the continued absence of the placental hormones is in some measure responsible for the development of the disease.

Groen suggests an aetiological factor:—

"In elderly dogs, especially females and especially females that have been spayed, one very frequently sees the development of mammary adenomas. Lately there have appeared in the press a few reports on elderly dogs with spontaneous diabetes. All these cases showed gross hypertrophy of the adrenals. In one of these cases which we described the posterior pituitary showed a gross predominance of eosinophilic cells and this has been found in other cases of spontaneous canine diabetes. I am suggesting, therefore, that a consequence of the prolonged oestrogen deficiency might be a hypertrophy of the eosinophilic cells which would lead to a hyperproduction of somatotropic hormone. This would exert an influence on the islets of Langerhans of the pancreas giving rise first to hyperactivity and then to exhaustion and diabetes. It is very striking that spontaneous diabetes in dogs, which is not rare at all, seems to be a part of the syndrome of age; these dogs show atrophy of the ovaries or the ovaries have been removed, mammary adenomas, gross hypertrophy of the adrenal cortices and excess of the eosinophilic cells of the pituitary."

While it may explain the causation of a very few cases, this theory does not correspond with the known facts both previously reported and as found in this series. Unfortunately no references are given by Groen but it may be assumed that he is referring to the excellent papers by Ricketts, Petersen, Steiner and Tupikova (1953), and Wrenshall, Hartroft and Best (1954) since these are the most detailed of those recently published. Wrenshall *et al.* recorded 6 of the 8 cases of pituitary eosinophilia reported earlier (Wilkinson). Both sets of authors report that the adrenals from their cases were normal. Ricketts *et al.* mention that hyperplasia was present but state specifically that it was not in excess of the degree normally found in elderly dogs.

Groen's emphasis on the lack of oestrogen seems misplaced for 3 reasons:—

(1) Neutered females form a very small minority of the bitches which develop the disease, 3.6 per cent. in the literature and 9 per cent. in this series.

(2) The onset of symptoms or exacerbation of the condition was associated with oestrum in at least 75 per cent. of the bitches.

(3) The oestrous cycle still occurs regularly in the majority of bitches in the age group (8 to 9 years) at which the incidence of diabetes reaches its peak.

Senescent (atrophied) ovaries were noted in only 2 cases; 1 was a 12-year-old animal and no details of the cycle were available, while the other was an 8-year-old bitch who had shown no sign of heat for 3 years. In a third case, with 12 months anoestrum, no *post-mortem* examination was performed. This theory might be held to account for these 3 cases but it must be remembered that some bitches are very adept at concealing all signs of "colour."

The significance of the high incidence in Dachshunds in this series is not easy to assess. Certainly this breed is not the commonest registered with the Kennel Club and it is certainly outnumbered by mongrels in any urban area.

Owners of Dachshunds in this series have been requested to loan pedigrees for further investigation, but there is not sufficient material at present available from which to draw any sound conclusions.

There has been no close relationship between any of the cases in this series. It is reported (but not confirmed) that 2 siblings of 1 case also died of diabetes.

It is standard procedure not to diagnose diabetes unless 2 samples of urine have shown the presence of reducing substances. While this method reduces the chances of a misdiagnosis, the delay involved may, in advanced cases, jeopardise the life of the patient. It cannot be too strongly urged, therefore, that, if the condition is suspected, the urine should be examined for ketones as well as glucose.

The rapidity with which a patient can deteriorate emphasises that if there is a possibility of a case being missed as a result of there being no urine available for analysis the blood glucose level should be estimated immediately.

Ovario-hysterectomy is perhaps rather a drastic therapeutic measure to advise but it is obvious from the frequency with which deterioration occurs during oestrum and pseudopregnancy that there is much to recommend it. It may even be recommended as a prophylactic measure in bitches whose dams have developed the disease.

There is a certain degree of antagonism to the idea of treating diabetic dogs and there are those who suggest that it is advisable to destroy the dog as soon as a diagnosis has been made. While the prognosis is certainly not always very hopeful it is felt that where the owners are prepared to accept the necessary extra work involved they should be encouraged to treat their pets. It is not a difficult disease for the veterinary surgeon to treat though it does entail frequent re-inspections and urine examinations.

From the comparative aspect, the aetiology of the condition appears to parallel the aetiology in man though so far there is no evidence of the disease arising from acromegaly, Cushing's syndrome or haemochromatosis. With further study, cases due to these conditions may emerge. Treatment appears to be fundamentally similar and on the whole the clinical picture in both species is the same. There are, however, some striking dissimilarities. In the dog there is little evidence of diabetic retinopathy, neuropathy or cardiovascular lesions (Wilkinson, 1957). The absence of these changes may be due to the relatively short life after diagnosis (Ricketts *et al.*, 1953). While the specific diabetic Kimmelsteil-Wilson lesion has been recorded in the dog

HARRY KEEN—SPONTANEOUS DIABETES IN MAN AND ANIMALS

FIG. 2.—Photomicrograph showing hyaline nodular deposits in a renal glomerulus of a long-standing diabetic.

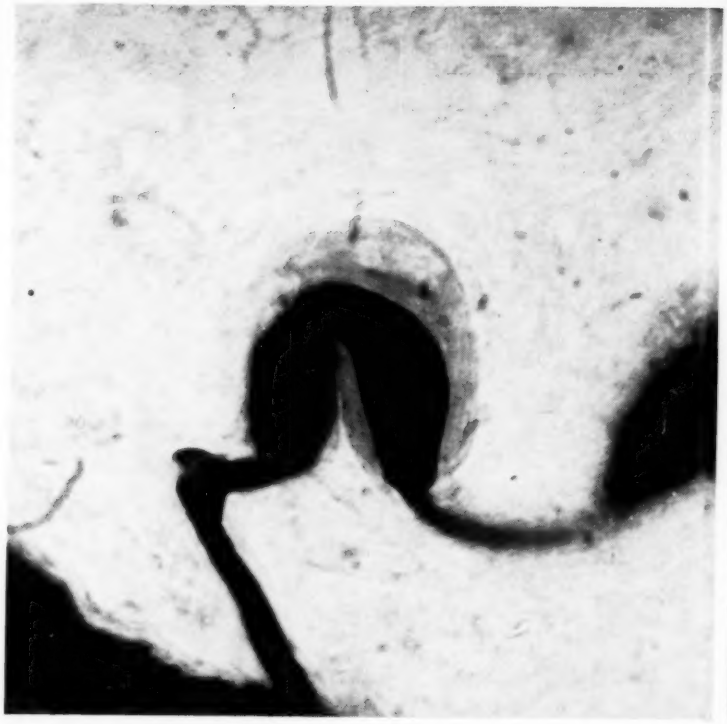


FIG. 3.—A loop at the venous end of a retinal capillary with a faintly staining "cap" investing it.

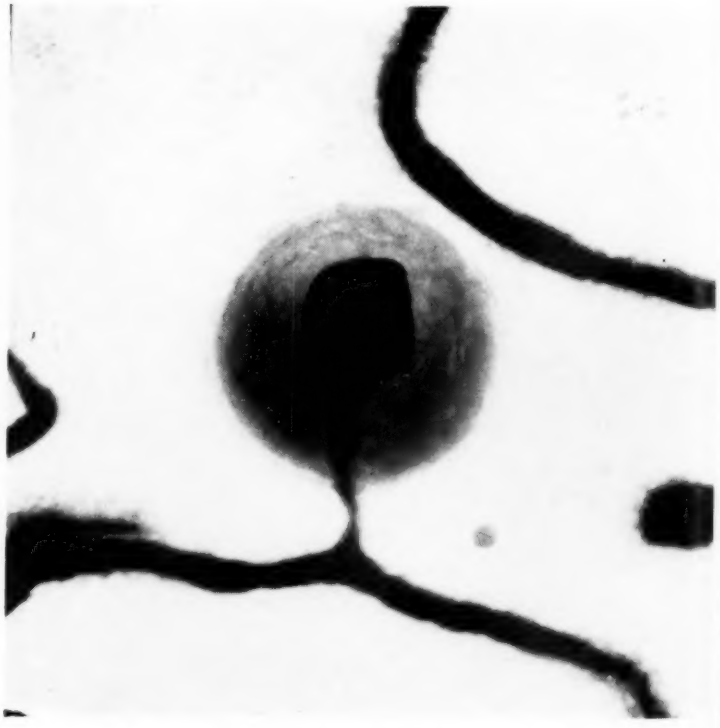


FIG. 4.—A "mature" microaneurysm with densely staining (Periodic Acid Schiff) material around it.

Spontaneous Diabetes in Man and Animals

BY

HARRY KEEN*

Senior Medical Registrar and Research Fellow, Medical Unit, St. Mary's Hospital, W.2, and Clinical Assistant, Diabetic Dept., King's College Hospital, S.E.5

THE gathering of information about diabetes mellitus in man is still far from completed, and, both at epidemiological and biochemical levels, there are large gaps in knowledge. A study which compares features of the disease in man with those in lower animals must thus also be incomplete ; and it would have been more so but for the large volume of information gathered by Wilkinson (1960) from which source this paper has drawn heavily.

The Clinical Picture

The comparatively uniform clinical pattern of the disease in animals contrasts strikingly with the manifestation of the disorder in the human where two main and other minor types can be made out (Lawrence, 1955 ; Hugh-Jones, 1955). In Europe and America onset of the disease in those aged less than 40 or so years is acute and dramatic. There is great thirst and polyuria, rapid weight loss and growing drowsiness which, untreated, deepens into coma and death. Onset in the elderly is usually quite different. Heavy glycosuria, unaccompanied by noteworthy changes in thirst or micturition, may be found quite by chance when the urine is tested at an insurance examination or before a surgical operation. So covert may the disorder be in the old that the appearance of the long-term complications may be the first clinical expression of the disease. Diabetes in the dog, by contrast, shows a fairly constant clinical pattern which has features of both human types. As in the young human case, there is polyuria, weight loss and ketosis ; like the elderly, the course is prolonged and coma occurs late. When it does, however, it is usually irreversible.

Ketosis

The chief cause of this species difference seems to lie in the comparative resistance of the dog to heavy

* Work supported in part by the British Diabetic Association.
Author's present address: Dept. of Experimental Medicine, Guy's Hospital, London Bridge.

Spontaneous Diabetes Mellitus.—*Concluded.*

there is some doubt as to whether the change noted was in fact true intra-capillary glomerulosclerosis. On the other hand chronic interstitial nephritis, which is rather common in dogs, appears to play a large part in the terminal stages of the disease.

It was interesting to note, after completion of this survey, that Campbell (1958) had also recorded the significance of oestrum in the development of the disease and had suggested that a number of cases developed the disease earlier than the case history suggested. He also found that treatment of diabetic coma was unsuccessful.

The disease as manifested in the 2 cats varied little from that described in the dog. Both were 13-year-old neutered males with the typical clinical history; 1 case was *in extremis* when first seen and was destroyed immediately, the second was destroyed on grounds of old age after over a year on insulin. The maintenance dose was 2 units and the cat showed no objection to the daily injections.

Acknowledgments.—I wish to thank primarily Dr. D. G. Harvey without whose help, encouragement and enthusiasm this work would not have been finished.

I also wish to acknowledge the help and co-operation of my colleagues in the Surgery, Medicine and Pathology Departments, and of many in practice who have supplied me with material, information and help.

This work forms part of a thesis presented for the degree of Ph.D. in London University and was carried out with a Scholarship from the Clement Stephenson Research Fund whose trustees I also wish to thank.

References

BISKIND, A. S., & SCHREIER, H. (1945). *Exp. Med. Surg.* **3.** 299.
BUTTERFIELD, W. J. H., KELSEY FRY, I., HARDWICK, C., & HOLLING, H. E. (1957). *Brit. med. J.* **ii.** 325.
CAMPBELL, E. A. (1958). *Aust. vet. J.* **34.** 222.
CROWLEY, M. F., WOLFF, F. W., & BLOOM, A. (1957). *Ibid.* **ii.** 327.
DAVIDSON, J. L., HAAS, K. B., & CONNOR, N. D. (1957). *Vet. Rec.* **52.** 497.
GARBERS, H. (1957). *Dtsch. tierarztl. Wsch.* **64.** 104.
GROEN, J. (1958). "Ciba Colloquia on Endocrinology." **12.** 135. J. & A. Churchill, London.
HARVEY, D. G. (1957). *Brit. vet. J.* **113.** 52.
HOLZWORTH, J., & COFFIN, D. L. (1953). *Cornell Vet.* **43.** 502.
HOE, C. M., & WILKINSON, J. S. (1958). *Vet. Rec.* **70.** 439.
JOSHUA, J. O. (1955). *M. & B. Veterinary Review.* **6.** 105.
LEE, J. (1954). *Brit. med. J.* **ii.** 1,087.
MAIGNON, F. (1911). *J. Med. vet.* **62.** 427.
NIEMAND, H. G. (1956). *Die Kleintierpraxis.* **1.** 1.
RICKETTS, H., PETERSEN, T. E. S., STEINER, P. E., & TUPIKOVA, N. (1953). *Diabetes* **2.** 288 .
SHOLL, L. B., & SALES, E. K. (1957). *N. Amer. Vet.* **39.** 1.
SMITH, E. M. (1946). *Amer. J. Clin. Path.* **16.** 457.
STRATTON, J., & WILKINSON, J. S. (1958). *Vet. Rec.* **70.** 1,223.
WALKER, G., SLATER, J. D. H., WESTLAKE, E. K., & NABARRO, J. D. N. (1957). *Brit. Med. J.* **ii.** 323.
WILKINSON, J. S. (1957). *Vet. Rev. and Annot.* **3.** 69.
———. (1958). *Ibid.* **4.** 93.
———, & HARVEY, D. G. (1958). *Brit. Vet. J.* **114.** 382.
WRENSHALL, G. S., HARTROFT, W. S., & BEST, C. H. (1954). *Diabetes.*

and prolonged ketonuria, the appearance of which in the human subject would indicate imminent coma and death. The evidence assembled by Wilkinson suggests that ketonuria in the diabetic animal is not due simply to a more ready excretion of ketones in the urine but does in fact represent a raised concentration of ketone bodies in the blood. The level of ketones in the blood is the result of 2 main processes, namely production of ketones (mainly by the liver), and their utilisation by peripheral tissues. In the normal non-obese human, ketonuria and ketonaemia can readily be promoted by dietary carbohydrate deprivation (Kekwick *et al.*, 1959). By contrast, prolonged fasting of the normal dog results only in small and insignificant ketosis, even when vomiting occurs (Wilkinson, personal communication). While this difficulty in producing ketosis in the normal dog may reflect the unimportance of fat as an energy store, it might also indicate a more effective peripheral utilisation and consequent clearance of ketone bodies from the circulation. Such an explanation could also be invoked to account for the apparent enhanced resistance to ketosis of the diabetic animal.

This variation in species response to ketosis brings up again the more fundamental question of the toxic rôle of the ketone bodies in themselves in causing coma and death in the diabetic. The condition of bovine ketosis is often presented as an example of the toxic qualities of ketone bodies (Johnson, 1953). Seen in parturient and lactating cows, the heavy ketosis which occurs in this condition is accompanied not by the greatly raised blood sugar levels of the diabetic but by abnormally lowered blood sugar concentration (Bach *et al.*, 1959). The hypoglycaemia is attributed to the diversion of circulating sugar into the milk, and the heavy ketosis explained by increased metabolism of fats and fat intermediates. In both conditions however the ketosis may have the same basic cause, namely the non-availability of glucose to the cell. In the diabetic, sugar is present in plenty but does not pass into the cell ; and in bovine ketosis there is no sugar to enter. Thus in the affected cow, it may be cellular hypoglycaemia rather than the systemic keto-acidosis which is responsible for coma and death ; and support for such a view comes from the observation that large intravenous infusions of glucose may rapidly restore the animal (Joslin *et al.*, 1959).

Treatment

The division of diabetics into 2 main clinical types referred to earlier is reflected also in treatment. Human beings developing diabetes early in life almost always require insulin to stay alive : by contrast, the great majority of later-onset patients can, at best, be rendered normoglycaemic with diet or oral antidiabetic drugs, and, at worst, remain hyperglycaemic without immediate threat to life. Virtually none of the dogs reported by Wilkinson responded to dietary restriction or to the sulphonylurea drugs and 97 per cent. of them required insulin. It is of interest to compare the relative insulin doses of man and dog and such a comparison is shown in Fig. 1 where the daily dose of insulin is expressed in insulin units per kg. of bodyweight. The data for the dogs are drawn

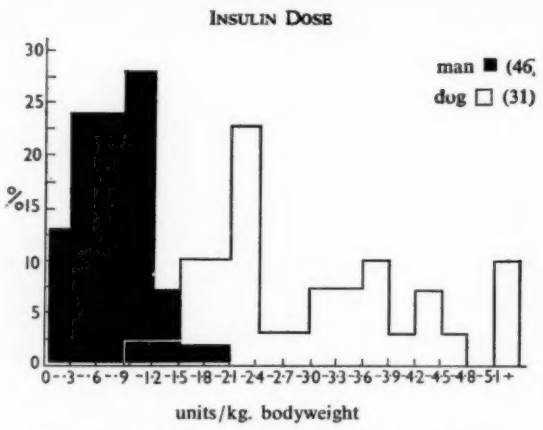


FIG. 1.—Insulin dose, per unit of bodyweight, in spontaneously diabetic human cases and dogs.

from Wilkinson's material and for man from an unselected group of patients attending St. Mary's Hospital Diabetic Clinic. On this bodyweight basis the requirement of the dog is clearly 2 to 3 times as high as man's needs. This rather striking difference must be seen in relation to the dog's greater comparative calorie intake (the greater part of which, be it noted, is in the form of protein), and also to the different body compositions of the species.

Complications of Diabetes

In man, the so-called complications of diabetes have come to be the commonest causes of morbidity and premature death. The chief of these complications are cardiovascular disease—principally atheromatous changes in coronary and other arteries, renal failure, and blindness. As to the first of these, the absence of arterial atheroma in the animal autopsies reported by Wilkinson stands in striking contrast to the situation in man. The " clean arteries " of diabetic animals seem to be only an extension of a general immunity of dogs to atheromatous vascular lesions and one can only speculate about its origin. In man, both quantity and quality of the diet may play a part in determining the incidence of arterial disease and a recent study with Dr. G. A. Rose suggested that men with clinical evidence of atheroma ate more than those without (Keen & Rose, 1958). Is animal susceptibility to arterial disease enhanced by prolonged overfeeding, by all the dietary components in general, or by any in particular ?

Of the other complications in man, the renal changes specific to diabetes have been well documented since they were first described by Kimmelstiel and Wilson in 1936. The discrete hyaline nodular change which they described in the glomerulus is well depicted in Fig. 2. The clinical picture is of heavy proteinuria, oedema, nitrogen retention and hypertension, and renal failure of this type is a common cause of death in the long-term diabetic. While uraemia and renal failure are also frequently seen in the diabetic dog, analogous glomerular changes are rarely if ever found.

Diabetic Retinopathy

Inspection of the retina with the ophthalmoscope reveals a characteristic appearance in many human diabetics. As the duration of the disorder lengthens, so increasingly one will see minute red "dots," blots of haemorrhage and hard white deposits, called exudate. Often, the retinal veins show increased tortuosity, and an appearance of irregularly distended segments described as "sausaging" or "beading."

In more advanced cases, intravitreal bleeding, neovascularisation, fibrosis with retinal detachment and blindness ensue. The fundamental pathological lesion in the diabetic retina is represented by the "dots." They are tiny aneurysms on the retinal capillaries and may be demonstrated in almost all long-term diabetics. In recent years, they have been closely studied by new techniques developed by Ashton (1949) by whose kindness Figs. 3 and 4 are reproduced here. They clearly show abnormal looping of the Indian-ink injected capillaries with adhesion of adjacent limbs of a loop and consequent aneurysm formation. The cap of polysaccharide material which characteristically invests the microaneurysm has the same histochemical properties as the glomerular hyaline nodule in the kidney. Although this has been regarded by some as evidence that the two lesions might be due to a common cause, it is probable that the deposits occur simply in consequence of microvascular damage. The factors responsible for microaneurysm production are unknown and knowledge on the subject has recently been summarised by Ashton (1959) and a tentative explanation put forward by him. Attempts to reproduce these retinal lesions in animals rendered diabetic artificially have been uniformly unsuccessful. It will obviously be of great interest and potential value to seek these lesions in the *spontaneously* diabetic animal—especially in those maintained for some time on insulin. Dr. Wilkinson and I would be very grateful for information about and material from such animals.

Other Aspects

There is a number of other less important comparative aspects which excite interest and merit brief comment. The well recognised excessive incidence of diabetes in elderly human females has been studied by Pyke (1956) and attributed to a "diabetogenic" influence of multiple pregnancies. He found that the proportion of diabetic women with large families is greatly in excess of that in the population at large, a finding recently confirmed and amplified by Fitzgerald (1960). This relation with parity does not, however, appear to hold in the bitch according to Wilkinson. Furthermore, the upsurge of the diabetic state during oestrus which he so convincingly demonstrates in the bitch has little if any counterpart in a menstrual variation of diabetes in women. Pregnancy in the diabetic woman is, however, usually accompanied by some rise in the insulin requirement, sometimes a considerable one.

Finally, hereditary factors which are so clearly of importance in the genesis of human diabetes appear to play a much less obvious rôle in the animal; information on this point is regrettably incomplete and a more open approach might help to throw an interesting light on an important aetiological feature of diabetes in animal and man alike.

Spontaneous Diabetes in Man and Animals.—*Concluded.*

Conclusion

The causes of diabetes mellitus remain unknown in both man and animals. In spite of certain species similarities, there are a number of important differences—differences in clinical manifestation, in aetiological factors and in the liability to certain long-term complications of the disease. Further study of the disparities is to be recommended for the light it might shed upon some current problems facing those concerned with the investigation and treatment of diabetes in man.

References

ASHTON, N. (1949). *Brit. J. Ophthal.* **33.** 407 (*et seq.*).
———. (1959). *Lancet.* **ii.** 625.
BACH, S. J., & HIBBITT, K. G. (1959). *Biochem. J. (Lond.).* **72.** 87.
FITZGERALD, M. (1960). Communication to Banting Memorial Meeting, Brit. Diab. Assoc.
HUGH-JONES, P. (1955). *Lancet.* **ii.** 891.
JOHNSON, R. B. (1953). *Amer. J. Vet. Res.* **14.** 366.
JOSLIN, E. P., & co-authors, "Treatment of Diabetes Mellitus." 10th ed. Kimpton.
KEEN, H., & ROSE, G. A. (1958). *Brit. Med. J.* **i.** 1,508.
KEKWICK, A., PAWAN, G. L. S., & CHALMERS, T. M. (1959). *Lancet.* **ii.** 1,157.
KIMMELSTIEL, P., & WILSON, C. (1936). *Amer. J. Path.* **12.** 83.
LAWRENCE, R. D. (1955). *Ann. Int. Med.* **43.** 1,199.
PYKE, D. A. (1956). *Lancet.* **i.** 818.
WILKINSON J. (1960). *Vet. Rec.* **72.**

Clinical Note

Permanent Ischial Arch Urethral Fistula in the Dog

John Rhodes

Northampton

THE creation surgically by intention of a permanent urethral fistula in a dog is described. No originality is claimed for this procedure but it is felt to be of possible interest as a treatment of recurrent urethral calculi.

Subject: Male Beagle aged 2¾ years.

History: This dog showed haematuria at 21 months of age and this responded to normal medical treatment.

Four months later the dog was presented again, this time with classical symptoms of urethral obstruction.

A cystotomy and urethrotomy were performed and approximately 25 calculi of varying sizes were removed from urinary bladder and urethra.

The dog was given repeated courses of urinary antiseptics and vitamin A was added to the diet, but during the ensuing 4 months 3 more obstructions of the urethra occurred, each of which was relieved by urethrotomy. During this period the diet was ad-

Permanent Ischial Arch Urethral Fistula in the Dog.—*Concluded.*

justed and the *p*H of the urine was also controlled with ammonium chloride orally. Finally, the owners considered euthanasia but agreed to one more operation.

Procedure: The dog was anaesthetised and a No. 3 catheter was passed into the bladder. After preparing the site an incision was made through the skin from the scrotum to within 25 mm. of the anus. The subcutaneous fat, fascia and muscles were divided and the urethra exposed. The stilette was withdrawn from the catheter, and the urethra severed with the catheter *in situ* at a point immediately dorsal to the scrotum.

The urethra was then dissected free from the surrounding tissues and brought to the surface 50 mm. ventral to the anus.

The dorsal surface of the cut end of the urethra was then incised for a distance of approximately 8 mm. and the edges of the new cut reflected outwards to form a triangular flap. This flap was then sutured to the edges of the skin incision with No. 1 black nylon. The subcutaneous tissue in the wound was drawn together with No. O catgut, and the skin incision closed with medium "Vetafil."

There was, as might be expected, a marked reaction around the operation site and after 3 days the dog was experiencing difficulty in passing urine once again. This was thought, wrongly it was later seen, to be due entirely to this reaction. It was found impossible to pass a catheter into the bladder and a cystotomy was carried out. No more calculi were found in the bladder but on attempting to pass a catheter out from within an obstruction was encountered 50 mm. distal to the neck of the bladder. It was found possible to pass a small catheter past the obstruction to the surface externally, and then a No. 3 catheter was reintroduced from the outside inwards immediately following the small catheter. This No. 3 catheter was sutured in place externally and the bladder was closed.

Daily irrigations with acriflavine solution were carried out to ensure the patency of the catheter and after 7 days the reaction had died down completely. The catheter was removed and shortly afterwards 2 more calculi were passed without difficulty and the dog made an uneventful recovery. Urine was passed freely and with considerably more force than is usually seen in the male dog.

The dog showed no distress or psychological disturbance at passing urine from this unusual place and continued to cock its leg in the normal manner.

Discussion: In most cases of urethral calculi in the dog, urethrotomy carried out immediately posterior to the penis bone provides an immediate and in most cases permanent relief provided that after care, diet, etc., are not neglected. But where obstruction recurs on several occasions it seems reasonable to suggest that the elimination of that part of the urethra traversing the ischial arch and penial groove may speed up the flow of urine and provide less opportunity for the formation of calculi.

THE INTERNATIONAL ASSOCIATION OF AGRICULTURAL JOURNALISTS

THE fourth annual conference of this Association was held in Peterhouse College, Cambridge on June 30th to July 5th. Delegates and representatives from Austria, Belgium, Denmark, France, Germany, Great Britain, Finland, Sweden, Switzerland and Italy made an attendance of over 80. The first and second days were largely devoted to meetings and to the reading of papers. On the evening of the second day, the Cambridge branch of the N.F.U. was host at Owen Webb House at a dinner at which the food and drink were entirely of British produce. The fare was delicious and a great credit to its producers. On the morning of the third day (Saturday), the party split into 3 groups to visit either the National Institute of Agricultural Botany, the Plant Breeding Institute, or the Cambridge A.I. Centre and the School of Veterinary Medicine. It is interesting to observe that about 80 per cent. of the delegates selected the "veterinary" tour, and great attention was paid to the excellent demonstration arranged at the A.I. Centre by Mr. L. E. Rowson and Mr. V. J. A. Manton, his assistant. The interest of agricultural journalists in stressing the importance of animal breeding in farm economy was marked by the type of questions asked, particularly after Mr. Rowson had outlined the progeny testing scheme for cattle. For the visit to the Veterinary School the delegates were met by Professor Beveridge, the Secretary, and members of the senior academic staff. The party was divided into groups, led respectively by Dr. Soltys, Dr. Rees Evans and Dr. Sainsbury, and toured the buildings. On Monday, a visit was paid to the 698 acre Abington Estate of the Land Settlement Association which is designed to permit an agricultural worker with limited capital to be an independent smallholder. In the evening the Conference Dinner was held in Peterhouse when a number of distinguished guests were present.

On the last day of the Conference, members were guests of the Royal Agricultural Society at the Royal Agricultural Show, Cambridge. This show was first held, under Royal patronage, in 1840 at Cambridge. In living up to its motto "Practice with Science" the "Royal" is, as usual, a unique show. This year 6 acres have been set aside for working demonstrations of machinery and buildings. The total entries of livestock (including poultry) was 4,588. In beef cattle, Herefords led over the Aberdeen Angus in show numbers, as did the British Friesians in the Dairy and dual purpose classes over the Jerseys and Ayrshires. There were 24 breeds of sheep, 18 of cattle and 10 of pigs to raise controversial issues in the minds of overseas visitors about individualism and breeding.

the nitrofurans Since their introduction the scope of this group of chemical compounds in the field of animal medicine has steadily widened. 'Bifuran' and 'Neftin' are two leading nitrofuran products which have achieved outstanding results in the prevention and treatment of many common livestock diseases.

bifuran	**controls**
NITROFURAZONE + FURAZOLIDONE	*enteritis in pigs* *coccidiosis in poultry*
neftin	**controls**
FURAZOLIDONE	*fowl typhoid, pullorum disease (BWD), salmonellosis, blackhead, hexamitiasis, coli septicaemia, infectious synovitis and coryza (colds)* *in broilers, turkeys, and laying fowls*

The value of these nitrofurans is not limited to the control of specific disease; their wide anti-bacterial action extends to the control of many secondary infections. Their routine use is invariably an aid to more efficient husbandry and more profitable farming.

Smith Kline & French Laboratories Ltd
Welwyn Garden City, Herts. Tel: Welwyn Garden 5111

LIFE-SAVING NITROFURANS

Licensees of The Norwich Pharmacal Co. USA

Brit. Pat. Nos. 649027, 679202, 735136, 735169, 765898

'Bifuran' and 'Neftin' are trade marks

G:PUB 10

For maximum potency with minimum side-effects

Anti-inflammatory

DECADRON

(DEXAMETHASONE)

Injection

Recommended for the following conditions in large animals:

ARTHRITIS	INFLAMMATORY EYE CONDITIONS
SYNOVITIS	ACUTE FULMINATING INFECTIONS
ALLERGIC CONDITIONS	NON-SPECIFIC DERMATITIS

and for "replacement" therapy in Acetonaemia

The outstanding advantage of 'DECADRON' Injection is dramatic lasting response without significant danger of side-effects

'DECADRON' Injection is supplied in vials giving 1-2 adult doses, depending on the severity of the case.

Agents to the Veterinary Profession:
MESSRS. COOPER, McDOUGALL & ROBERTSON LIMITED, BERKHAMSTED, HERTS

Agricultural Division
MERCK SHARP & DOHME LIMITED, HODDESDON, HERTS

Current Literature

ABSTRACTS

The Measles Virus. Wright, Joyce. (1959). *Practitioner*. **183.** 596.

Though 200 years ago a crude method of immunisation against measles was described by Francis Home, it is only recently that in America vaccination against measles has been brought virtually within reach. This has been made possible by the isolation of measles virus is primate tissue cultures. Studies of the immunological response following natural measles infection in human beings show that both neutralising and complement-fixing antibodies develop.

Recent work has held out promise of the propagation of measles virus in cultures of chick embryo cells. It is possible that this may prove to be a source of material from which a measles virus vaccine may be prepared for human use.

Certain resemblances between the clinical manifestations and pathology of measles and dog distemper have been noted. Study of the two viruses suggests possible immunological relationship. It is suggested that the 2 viruses possess antigenic components in common. Thus the cytopathic effects of measles virus in HeLa cell cultures were inhibited by distemper antiserum and conversely the pathogenicity for mice of distemper virus was neutralised by measles antiserum prepared in ferrets. Further, there occurred significant increases in neutralising antibodies against distemper virus between acute—and convalescent—phase sera from measles patients.

Interferon : The Prospects. Isaacs, A. (1959). *Practitioner*. **183.** 601.

Interferon is a substance which shows in laboratory tests the behaviour one would expect of a wide-spectrum antibiotic. Interferon was found 2½ years ago during a study of the virus interference phenomenon. It has been known for almost 24 years that one virus will interfere at the cellular level with growth of many unrelated viruses. The first virus will interfere even when it has been rendered non-infective by heat or irradiation with ultra-violet light. Large doses of inactive virus may prove toxic, and may act as an antigenic stimulus making it unwise to use the same material twice.

In 1957 it was demonstrated that when an interfering virus is incubated with suitable cells there is formed in the cells and released into the medium a substance which can induce interference in fresh cells—hence the name interferon—but interfering virus and interferon are quite different. What is of importance is that interferon is relatively non-toxic for cells and is either non-antigenic or very poorly antigenic.

Interferon can be produced by incubating influenza virus inactivated by ultra-violet light with whole-chick chorio-allantoic membranes. Interferon is produced in the cells lining the membrane and is liberated into the suspending medium from which it can be concentrated and partially purified. It will be necessary to use different animal cells for experiments on the protective effect of interferon in infections of animals.

At the moment purification presents a greater problem than production. It is known that interferon is a protein a little smaller than serum antibody.

The author states that there is no known animal virus which is not susceptible to interferon, but there is a striking variation among different viruses in their susceptibility to different doses of interferon.

Tests *in vitro* show that a single dose of interferon will protect cells from infection with West Nile virus for most of the lifetime of the cells. The resistance could, however, be broken down by providing the cells with nutrients which encourage cell division ; presumably the interferon was diluted out as the cells divided. Presumably, also as most animal cells do not divide more rapidly than once every 24 hours, it might be sufficient to inject interferon daily.

The practical aim behind this work is to protect man against virus infections. There is, however, a great deal of work ahead and many pitfalls to be avoided before an experimental laboratory wide-spectrum antibiotic can become a clinically useful antibiotic.

G.F.B.

Keratitis Pigmentosa. Beamer, R. J. (1960). *Mod. Vet. Pract.* **41.** 34.

In this, the third of a series of articles on diseases of the eye, the author deals entirely with the condition of keratitis pigmentosa, in which there is a deposition of melanin in the cornea. He claims that this condition is responsible for more cases of blindness in dogs than any other disease of the eye, including cataract.

After enumerating and discussing the various causes of the condition, the author gives a detailed description of the treatment. In this, the first stage consists of removal of the pigmented layer by means of a No. 15 Bard Parker blade or a cataract knife. Once the pigment has been removed, it is essential to destroy the excessive vascularisation which occurs under the pigmentary layer. It is also advisable to destroy the feeder vessels originating on the scleral side of the limbus, which carry nourishment to the area of vascularisation. This is best achieved by swabbing the vascular area with liquid phenol.

Because of the relatively great sensitivity of the endothelium of the blood vessels to radiation, the use of beta rays has played an important part in the prevention and destruction of corneal vascularisation. Beta radiation is also of value because of its limited range of penetration which prevents damage to the deeper structures of the eye.

The author has similarly had good results using beta ray therapy in early cases of pigment formation, particularly if treatment is instigated when the pigment is just beginning to invade the cornea.

J.S.J.L.

A Case of Rupture of the Colic Mesentery and subsequent Strangulation of the Intestine by the Uterus following Service (translated title). Hauser, H., and Messerti, W. (1959). *Schweiz. Arch. Tierheil.* **101.** 381.

A five-year-old Freiburger mare was served 9 days following first foaling. The service act appeared perfectly normal, but after 5 hours mild colic was noticed, and 6 hours later, though colic was subsiding, veterinary attention was summoned. Findings: moderate colic pains with quiet intervals, temperature 38·3 (100·8), pulse 56, membranes normal, abdomen tucked up, peristalsis on left side almost normal, on right much reduced. No appetite or defaecation. Vaginal examination: no damage visible, coils of intestine palpable through wall, Rectal examination: rectum empty and normal, caudal end of small colon (50 to 60 cm. from anus) immovable and tightly fixed, while ventrally packed and gas-filled coils of intestine were palpable. Diagnosis : stricture of small colon, cause unknown. Treatment : Novaminosulfon 50 per cent. 30 c.c. intravenously and abdominal friction with spirits of camphor. Next day 9 a.m. : mare dull, pulse 96, body cold, abdomen tense, no peristalsis. Vaginal and rectal examination : findings as before. The mare was sent to slaughter.

Post-mortem findings: in the suspension of the small colon, about 14 inches from the anus, and close to the small colon itself there was a tear large enough to insert the hand. Through this opening, from left to right, the uterus, with both horns, projected exerting strong pressure on this section of bowel. Uterus and contacting small colon were pale and anaemic ; the colic suspension cranial to the site was haemorrhagic, the colon here likewise dark red following venous stasis, the lumen filled with faeces. Further forward, about 20 inches cranial from the area of constriction, was a further tea-plate sized area of haemorrhage in the colic suspension, with a central tear measuring about 1 inch by 2 inches. Small haemorrhages occurred on the mucous membrance of the dorsal vagina, cervix, and uterus.

It is presumed that the incompletely involuted uterus was forced through the suspension of the colon by the penis of the stallion, the uterus then having the tendency to fall forwards and downwards due to its great weight.

No case of rupture of the colic suspension following service was found in the literature. Had an exact diagnosis been made in the live animal it is very doubtful whether the condition could have been corrected surgically.

Treatment of Chronic Oedema in the Bovine Udder (translated title). Mittelholzer, L., jnr. (1959). *Schweiz. Arch. Tierheil.* **101.** 600.

A private practitioner gives brief details of the use of a corticosteroid and a sulphonamide having a diuretic action on, respectively, 6 and 9 cases of chronic oedema of the udder in cattle. In his practice veterinary attention is frequently required for those high-yielding cows in which the oedema, present at calving, does not subside after 10 to 12 days. Without attention, the effects vary from mere unsightliness to loss of quarters. Previous forms of treatment have been based on relief of the local circulatory disturbances by repeated milking, calf suckling, salves, and circulatory stimulants ; recently hormonal preparations and hyaluronidase have been equally ineffective.

Trial with Vecortenol (CIBA, Basle), a corticosteroid : 6 cows (2 acute physiological, 4 chronic oedema cases) were treated as follows—1st day 200 mg. intramuscularly, 4th day 125 mg. intramuscularly, 7th day 125 mg. intramuscularly. Result—3 cows cured (both physiological cases, only 1 chronic).

Trial with Vetidrex (CIBA, Basle), which is a sulphonamide having no bacteriological action, and regarded as a saline diuretic, acting on the renal tubules, preventing tubular reabsorption of sodium and chlorine ions : 9 cows (only chronic oedema cases) were treated with 2 or 3 doses of 3 to 5 ml. (150 to 250 mg.) Vetidrex intramuscularly at 3-day intervals. Result—7 cows cured (complete disappearance of oedema in about 8 days), remaining 2 cows much reduced oedema.

No toxicity was observed, nor was there any reduction in milk yield. A.D.W.

Clinical Experiences with a New Glucocorticoid. Ellsworth Willis, T. (1959). *Vet. Med.* **54.** 489.

A comprehensive clinical report is given by the author on the use of a new prednisolone analogue—Azium (Schering). Although the results of this trial do not constitute a controlled research programme, the author has been careful to treat an equal number of similar cases with prednisone or prednisolone and to use conditions where previous experience had indicated that the use of steroids would produce a significant relief of symptoms.

Altogether 157 cases are listed which showed an excellent response to Azium. However, as the cases range through such a variety of conditions as coxofemoral subluxation, osteoarthritis, otitis externa, food poisoning, chronic interstitial nephritis, corneal laceration, tonsillitis, mast cell cytoma etc., it is felt that more conventional and less expensive forms of treatment would be equally effective.

The most interesting feature of the trial is the clinical confirmation of the laboratory findings, that this drug is 80 to 100 times more potent than hydrocortisone, and 20 times more potent than prednisone or prednisolone. The average maintenance dose has been evaluated at 0·25 mg. per 25 to 30 lb. bodyweight. This need only be given every other day which has a great advantage from the client's point of view. J.S.J.L.

Effects of Certain Antibiotics in the Treatment of Vibriosis in Sheep. Hulet, C. V., Ercanbrack, S. K., Price, D. A., Humphrey, R. D., Frank, F. W., & Meinershagen, W. A. (1960). *Amer. J. Vet. Res.* **21.** 441.

Vibrionic abortion appeared in 2 flocks of ewes. They were divided into 3 groups : (1) Untreated ; (2) Each ewe given 80 mg. chlortetracycline ; (3) Each ewe given injections of pencillin-streptomycin (800,000 units—1·0 g.) on 2 consecutive days.

Treatments (2) and (3) appeared to increase the chances of ewes having at least 1 live lamb but the original paper would repay study by those interested. G.B.S.H.

B.V.A. Congress Programme: Glasgow, 1960

SUNDAY, August 28th

2.30 p.m. Congress Office open.
6.30 p.m. Annual Service : University Chapel.
7.45 p.m. Council Meeting : Men's Union, University.
8.15 p.m. West of Scotland Division " At Home " and Film Show : Men's Union.

MONDAY, August 29th

9.30 a.m. Official Opening and Trades Exhibition : Bute Hall, University.
11.15 a.m. Group Photograph : University, South Front.
11.45 a.m. Annual General Meeting : Bute Hall.
1.30 p.m. Leave for first visit to Johnnie Walker Ltd.
2.30 p.m. Symposium : Brucellosis.
The Prophylaxis of Brucellosis in Cattle : Dr. A. McDiarmid.
Eradication in Northern Ireland : Dr. W. R. Kerr.
Eradication in the Netherlands : Dr. G. M. van Waveren.
Epidemiology and Prevention of Human Brucellosis : Dr. P. W. Bothwell.
3.45 p.m. Case-reporting Session.
4.45 p.m. Films : University.
8.00 p.m. Civic Reception : City Chambers, George Square.

TUESDAY, August 30th

9.30 a.m. Symposium : Poultry Disease and the Practitioner.
Infectious Diseases : J. D. Blaxland.
Leucosis and Fowl Paralysis : W. A. M. Gordon.
Coccidiosis : Dr. C. Horton-Smith.
Nutrition and Nutritional Diseases : W.W.C. Gibson.
Symposium : Disorders of Calcium metabolism.
Experimental Studies of the Relationship between the Calcium-Phosphorus Ratio of the Diet and Fertility in Heifers : A Preliminary Report : A. Littlejohn and E. Lewis.
Some Aspects of Hypocalcaemia in Cattle : Dr. E. W. Moodie.
Calcium-Iron Relationships in the Fattening Pig : Dr. W. A. Greig.
The Effect of Calcium and Phosphorus Deficiency on Bone Growth in the Dog : J. R. Campbell.
10.30 a.m. Fashion Show :
12 noon Plenary Session : The Economics of Animal Health : Prof. W. I. B. Beveridge.
2.30 p.m. Surgical Demonstrations (Televised) : Veterinary Hospital.
4.00 p.m. University Reception : Veterinary Hospital.
7.30 for 8.00 p.m. Annual Banquet : Central Hotel.

WEDNESDAY, August 31st

10.00 a.m. 10.00 for 10.30 a.m. Leave for Cruise to the Kyles of Bute by R.M.S. *Queen Mary II* from Bridge Wharf.
2.30 p.m. Films : University.
8.00 p.m. Edinburgh Tattoo (1st performance) : 'Bus leaves Glasgow 6.15 p.m.
Alumnus Dinners.
10.30 p.m. Edinburgh Tattoo (2nd performance) : 'Bus leaves Glasgow 8.30 p.m.

THURSDAY, September 1st

9.30 a.m. Symposium : Diseases of the Bovine Foot.
Applied Anatomy : J. A. Taylor.
Surgery of the Bovine Foot : Dr. G. H. Arthur.
The Clinical Problem : C. Wood.
Symposium : Diseases of Sheep.
The Prevention of Pulpy Kidney Disease : Dr. R. F. Montgomerie.
Sudden Death in Sheep : Dr. J. A. A. Watt.
Experimental Scrapie : Some Recent Work : J. M. K. Mackay, W. Smith and J. T. Stamp.
Anaemia in Trichostrongyloid Infections : Dr. J. A. Campbell and A. C. Gardiner.
10.00 a.m. Ladies' Guild A.G.M. : Q.M.U.
11.30 a.m. Ladies' Tour to the Trossachs.
12 noon Plenary Session : Veterinary Education : Prof. W. L. Weipers.
1.30 p.m. Leave for second visit to Johnnie Walker Ltd.
2.30 p.m. Golf Competition : Hilton Park.
Demonstrations (Televised).
(i) Measurement and Description of Horses : J. McC. Ingram.
(ii) The Examination of Horses for Soundness —A Preview of The British Veterinary Association's Recommendations : C. Davenport.
4.00 p.m. (iii) Case Presentations.
8.00 p.m. Ladies' Guild Dance : Central Hotel.

FRIDAY, September 2nd

9.00 a.m. Symposium on Husk.
The Disease Process : Dr. W. F. H. Jarrett, F. Jennings, Drs. W. I. M. McIntyre and W. Mulligan, N. C. C. Sharp and Dr. G. M. Urquhart.
Treatment with Cyanacethydrazide : Dr. J. K. Walley.
Treatment with Diethylcarbamazine : W. H. Parker.
Recent Experiences with Vaccination : Dr. D. Poynter and B. V. Jones.
11.30 a.m. Experiences with a Scheme for Supervising Pig Herds believed to be Free from Enzootic Pneumonia (Virus pneumonia) : Drs.R.F.W. Goodwin and R. Whittlestone.
Some Common Surgical Entities in the Budgerigar : L. Arnall.
2.30 p.m. Radiography in Small Animals : D. D. Lawson
3.30 p.m. Symposium on Enteric Diseases of Calves.
Husbandry in Relation to Calf Diarrhoea : A Review : Prof. J. S. S. Inglis.
The Ecology of the Intestinal Bacteria with special reference to *E. coli* : Dr. H. Williams-Smith.
Infection by *E. coli* and Salmonella : P. L. Ingram and Prof. R. Lovell.
Antibiotics and Calf Diarrhoea : R. G. Dalton, E. W. Fisher and W. I. McIntyre.
5.00 p.m. Films.
8.00 p.m. President's Reception : Central Hotel.

SATURDAY, September 3rd

9.30 a.m. Adjourned A.G.M. and First Meeting of Council, 1960–1 : Engineering Dept., University.

Notes

Congress Headquarters	...	Queen Margaret Union, The University.
Scientific Papers	}	Department of Engineering, The University.
Scientific Exhibition		
Demonstrations with Closed-circuit Television	...	Veterinary Hospital, Garscube Estate, Bearsden.
Trade Exhibition ...	...	Queen Margaret Union, The University.

Limited Admissions : Demonstrations

Admission is limited to 275 members at the surgical demonstrations and at the demonstrations on Thursday afternoon.

Visits to the Veterinary Hospital

'Buses will be available from the Headquarters at the Queen Margaret Union to the Veterinary Hospital.

Golf Competition

Ladies and gentlemen wishing to compete for the cups at Hilton Park are asked to send their names to Dr. T. A. Douglas, Department of Biochemistry, The Veterinary Hospital, Bearsden Road, Bearsden, Glasgow, as soon as possible. The entry is limited to 40.

Creche

A day-time creche is planned in the University, close to the Queen Margaret Union. It is also hoped to provide an evening baby-sitting service.

News and Comment

AN OFFER OF SERVICE

A British-born, German domiciled veterinary student is seeking holiday work in a mixed practice which includes sheep. He wishes to earn at least his railway fare during a two-month period. It is suggested that he might be employed in 2 different practices for one month each. He is in his last year, speaks excellent English, and is recommended by a member of the profession as a conscientious worker. Offers should be made direct to Mr. J. Leslie, München 9, Plassenburg Str. 13, bei Frey.

MR. WALTER SCOTT

Mr. E. R. Corrigall writes:—

Walter Scott's sudden and untimely death came as a great shock to his many friends and colleagues, and his passing will leave a gap in the profession and the wide community in which he mixed.

His range of interests in the County of Worcester, which he loved and knew so well, was wide and varied, and his buoyant and friendly personality endeared him to everyone with whom he came in contact.

To have worked with Walter Scott as a colleague over many years was a privilege one will always remember with affection, for it was in this sphere that one came to recognise his loyalty and integrity and appreciate fully his generosity and gaiety of spirit.

Our sympathy goes out to his wife and family in their tragic bereavement.

TRAINING COURSE IN FOOT-AND-MOUTH DISEASE

The 13th Training Course in Foot-and-Mouth Disease organised by the Pan American Centre took place from June 5th to 18th under the supervision of Dr. William M. Henderson, Director, and Dr. Peter R. Ellis, Chief of Field Services. With the co-operation of the Ministry of Agriculture, Colombia, it was possible to hold the course in Bogota.

The following countries, some of them British territories, were represented: Bahamas, British Guiana, Curaçao, French Guiana, Jamaica, Martinique, Puerto Rico, Surinam, and Trinidad.

The aim of the course was to present the veterinary services of these countries—which are free from foot-and-mouth disease—with current appreciation of the problem of the disease, the control of importations necessary to maintain freedom from it and actions necessary in the case of an introduction of infection.

Over a 2-week period close examinations were made of the progressive changes of foot-and-mouth disease lesions. Animals which had been inoculated with the virus 2 days prior to the beginning of the course provided an excellent introduction on the first day when vesicles were observed on the tongue. Other animals were inoculated during the course to provide a constant supply of lesions at different stages. A study was also made of the lesions occurring in affected pigs. Lectures and discussions continued daily, covering a revision of foot-and-mouth disease treatment and precautions, the clinical signs, pathology and epizootology.

Vaccination against foot-and-mouth disease is receiving great encouragement from the Colombian Ministry of Agriculture. In 1959 3,830,000 vaccinations were made and in the first three months of 1960 1,017,000 animals received vaccine. It is estimated that in 1964 nearly 16,000,000 animals will be vaccinated—an increase to 52 per cent. of the total cattle population. Two types of foot-and-mouth disease exist in Colombia, A and O, and it was agreed that, whilst no vaccine gives a hundred per cent. protection, in a country with artificial boundaries vaccination is certainly of value.

AFRICAN HORSE DISEASE IN THE NEAR EAST

Vast numbers of horses, mules and donkeys in an area from eastern Turkey to India have been infected with African horse sickness, which threatens to take a devastating toll of animals which are essential to the life of the region, states an FAO message from Rome. FAO veterinarians state that appeals for help—in the form of vaccines and trained personnel—are arriving at their headquarters from a number of countries in the Near East. A South African consultant, Dr. B. Howell, has been sent to the Razi Institute in Teheran, Iran, to train veterinary workers in the production of a vaccine which has been developed to prevent infection in Africa.

"We still do not know whether the vaccine will prove to be effective," said Dr. E. A. Eichhorn, the director of FAO's Animal Health Branch. "The virus in the Near East is similar to, but not identical with, the 7 known strains of African horse-sickness virus. If the Near East outbreak is the result of one of the known African viruses or a similar one, and if we can find the personnel and sufficient numbers of mice in which to produce vaccine, we can produce it in some quantity in a relatively short time; if the virus differs radically from known strains, it will take at least 4 to 5 months to achieve an effective vaccine."

In the meantime, it is feared that the disease will have a disastrous effect in the countries of the Near East, where horses, mules and donkeys provide the main source of power and transport for farmers.

The disease attacks the lungs and respiratory tracts of the animals, and moves into the intestines. It resembles the human epidemic of influenza in 1918. In southern Iran it has been reported that about one half of the equine population of 200,000 has been infected, with a 90 per cent. mortality rate. If the disease spreads to the Mediterranean countries, it would have very serious consequences in Bulgaria, Yugoslavia and Greece, where agriculture relies heavily upon animals.

The Onderstepoort Institute has been providing vaccine but cannot undertake the production of the millions of doses now required. It is authoritatively stated that a carefully-planned regional campaign must be undertaken if a catastrophe is to be avoided.

THE REGISTER OF VETERINARY SURGEONS

The President of the Royal College of Veterinary Surgeons, Mr. J. N. Ritchie, C.B., attended a ceremony in the Arts Theatre of the University of Liverpool on the afternoon of July 2nd for the purpose of admitting to membership of the Royal College graduates in Veterinary Science of the University who had received their degrees at a congregation held that morning. A large gathering of members of the Faculty of Veterinary Science, the academic staff, the new graduates, their parents and friends was addressed by Mr. Ritchie, who was thanked by the Dean of the Faculty, Professor J. G. Wright, for his inspiring and impressive words. After the ceremony, those present were guests of the University at tea in the main hall of the Victoria Building. The following were admitted to membership of the Royal College:—

Allen, William Maurice, Tatham Farm, Ruabon, Wrexham, Denbighshire; Batty, Anthony Felix, South View, Ashford Avenue, Ashton Road, Lancaster; Capron, Thomas Keith, 37, Ely Road, Llandaff, Cardiff, Glam.; Chesworth, Anthony Trevor, 300, Lord Lane, Failsworth, Nr. Manchester; Dawkes, Brian Harold, 45, Rosthwaite Road, West Derby, Liverpool, 12; Edwards, John David Delme, Highway Farm, Newport, Pembs.; Evans, William Elvey Sior, Capel Farm, Bancycapel, Carmarthen; Fell, Colin, 486, Fulwood Road, Sheffield, 10, Yorks; Gyening, Kwame Obeng, c/o Dept. of Veterinary Services, Accra, Ghana; Hardy, Barrug Desmond Walker, 26, College Road, Sutton Bonington, Loughborough, Leics.; Holt, Harold Jeffrey, 27, Chequer Lane, Upholland, Nr. Wigan, Lancs.; Hopkins, David Lea, Antrobus House, West Street, Congleton, Cheshire; Jones, Gareth Wyn, Brithdir Farm, Bangor, Caerns.; Jones, Ronald Samuel, Chapel House, Racecourse, Oswestry, Salop; Miller, John Keith, 3, Carrs Crescent, Formby, Liverpool, Lancs; Milner, Nigel Andrew, 3, Parkfield Road, Didsbury, Manchester, 20; Peel, David Robert, 34, Woodlands Road, Gomersal, Nr. Leeds, Yorks; Pickup, Pamela (Miss), 68, Bankside Lane, Bacup, Lancs.; Procter, George, 4, Rosemede Avenue, Kendal, Westmorland; Rigby, John Philip, 17, The Green, Acomb, York; Shreeve, Brian John, 93, Low Road, Lower Hellesdon, Norwich, Norfolk, NOR 22L; Taylor, Kevin Christopher, 151, Milner Road, Heswall, Wirral, Cheshire; Thomas, John Keith, Neston, Glyndwr Road, Gwernymynydd, Mold, Flints; Vaughan, Alwyn, 10, Chapel Street, Menai Bridge, Anglesey; Walker, David, 37, Wallace Road, Loughborough, Leics.; Walker, John Michael, 65, Wensley Road, Woodthorpe, Nottingham; Zagni, Paul Adrian, 7, Redding Cottages, Clapton-in-Gordano, Portishead, Nr. Bristol, Somerset.

The following gentlemen were admitted to membership of the Royal College in virtue of the registrable degree of Vet.M.B. of the University of Cambridge on June 25th, 1960:—

Bacon, Andrew Joseph, M.A., VET.M.B. (CANTAB.), Likoma, Seaton Down Road, Seaton, Devon; Chandler, Colin Rex, B.A., VET.M.B. (CANTAB.), Hubert Cottage, Bloomfield Road, Odd Down, Bath, Somerset; Groocock, Christopher Michael, B.A., VET.M.B. (CANTAB.), Iseleigh, Desborough, Kettering, Northants; Hugh-Jones, Martin Eales, B.A., VET.M.B. (CANTAB.), Christ's College, Cambridge; Jeffrey, Bryan, B.A., VET.M.B. (CANTAB.), 26, Saltwell Road South, Gateshead, 9, Co. Durham; Loveday, Bryan Robert, B.A., VET.M.B. (CANTAB.), Tregoth, Exeter Street, Launceston, Cornwall; Medd, Richard Meith, B.A., VET.M.B. (CANTAB.), 15, Bigwood Road, London, N.W.11; Millard, Roger Stuart, B.A., VET.M.B. (CANTAB.), Short Hill, Livesey Road, Ludlow, Salop; Richmond, Brian Tyrrell, M.A., VET.M.B. (CANTAB.), 46, Whyteleafe Road, Caterham, Surrey; Shepherd, Allan Leslie Mark, M.A., VET.M.B. (CANTAB.), 4, Hills Road, Cambridge; and Steven, Donald Hume, B.A., VET.M.B. (CANTAB.), Willowby Lodge, Meavy Lane, Yelverton, S. Devon.

UNIVERSITY NEWS

Bristol

Second Examination for the Degree of B.V.Sc. (Sections I and II)

(SECTION I = ANATOMY, PHYSIOLOGY AND PHARMACOLOGY; SECTION II = ANIMAL HUSBANDRY I)

Pass. Porter, Miss S. P.; Walker, Miss E. P.; and Walsh, Miss M. H.

In Section II (Animal Husbandry I) Completing Examination

Baker, G. J. (Distinction); Dunford, S. J.; Foster, S. J.; Garratt, R. C.; Gregory, D. C.; Griffin, R. B.; Kelly, A. M.; Ratcliff, J. A.; Sharpe, W.; Shillabeer, E. H.; Stephens, D. B. (Distinction); Stephens, D. E.; Taylor, Miss J. K.; Wilsmore, A. J.

In Section I only

Forbes, J. S. R.; King, N.; Nurse, R. G.

In Section II only

Godfrey, A. J.; Wallace, N. J.

Final Examination for the Degree of B.V.Sc. (Section II)

(SECTION II = MEDICINE AND SURGERY)

Anstey, Miss J. M.; Blake, K. J.; Burrows, C. J.; Davies, H. E.; Farman, R. S.; Jenkins, C. T.; Morris, J. M.; Peace, M. D.; Perry, M. D.; Roach, M. J.; Sanders, K. J.; Sebesteny, A.; Skelton, W. E.; Stoker, J. W.; Turner, P. J.; White, K. B.; Wilkinson, K. R.; Young, R. C.

Cambridge

The following passed the final examination for the degree of Bachelor of Veterinary Medicine at the end of the Easter Term:—

A. J. Bacon (Gonville and Caius College), C. R. Chandler (Emmanuel College), C. M. Groocock (Trinity College), M. E. Hugh-Jones (Christ's College), B. Jeffrey (St. John's College), B. R. Loveday (Downing College), R. K. Medd (Selwyn College), R. S. Millard (Pembroke College), B. T. Richmond (Pembroke College), A. L. M. Shepherd (Fitzwilliam House), and D. H. Steven (King's College).

They were admitted to membership of the Royal College of Veterinary Surgeons by the President, Mr. J. N. Ritchie, C.B., at a ceremony held at the School of Veterinary Medicine on Saturday, June 25th, following conferment of the Vet.M.B. degrees at the Senate House.

Edinburgh

The undernoted candidates have passed Part II Examination for the Diploma in Tropical Veterinary Medicine:—

Butler, Michael C., B.SC., M.R.C.V.S.; Hutchings, Donald A., M.R.C.V.S.; Kathuria, Jai D., B.SC. (VET.) (BOMBAY); Kodituwakku, George E., B.V.SC. (CEYLON), PH.D. (LONDON); Kuruneru, Ariyapala, G.V.SC. (CALCUTTA); Le Riche, Philip

D., B.V.M.S., M.R.C.V.S.; Noordin Keling, Mohamad, G.V.SC. (CALCUTTA), M.R.C.V.S.; Parkes, William D. C., M.R.C.V.S.; Shanmugalingam, Kandia, B.SC. (VET.) (BOMBAY), Siddiqui, Ekramul H., G.V.SC. (BIHAR), M.SC. (OHIO); Wakeem, Abdallah A., B.V.SC., M.R.C.V.S.; and Wells, Eric A., M.R.C.V.S.

The undermentioned candidates have passed the Third Professional Examination (Part I) in Veterinary Pharmacology for the degree of Bachelor of Veterinary Medicine and Surgery:—

Cathcart, Hugh A. A., Clark, William A., Copland, Alexander N., Davies, Lewis D., Fergusson, Kenneth R. C., Forgrave, Bryan T. G., Forrest, Dugal T. M., Foster, William N. M., Frankland, Anthony L., Grave, Jill B., Gribbin, Henry J., Hodgson, Jackson, Jones, Meredydd, Kelly, James M., Linklater, Karl A., Linscott, Thomas B., Loughery, Samuel, Martin, Ronald N., Morgan, John R. G., Ridgeway, Andrew E., Ross, Ian C., Sargeant, John P., Taylor, William P., Thompson, Robert S., Waters, Richard J., Wilson, Michael, and Wrathall, Anthony E.

Third Professional Examination (Part II), Veterinary Pathology, Bacteriology and Parasitology for the B.V.M. & S. degree:—

Bailey, Sheila A., Davies, Lewis D., Lander, Keith P., Meldrum, Keith C., Robertson, John F., Rodger, John O. K., Wheeler, Michael, and Wilson, Michael.

Third Professional Examination (Part II), Veterinary Pathology:—

Bell, Alastair F., Blake, George, Forbes, Derek, Jones, Robert A., MacIntyre, Gerald C., Paterson, Robin J., and Somerville, James C.

Third Professional Examination (Part II), Veterinary Bacteriology:—

Arbuckle, James B. R., Coulthwaite, John R., Hargreaves, Charles E., Martin, Ronald N., Ross, Ian C., Sargeant, John P., Somerville, James C., and Stewart, Hugh D.

Third Professional Examination (Part II), Veterinary Parasitology:—

Gardner, David W., Martin, Ronald N., Ross, Ian C., Sargeant, John P., and Stewart, Hugh D.

Liverpool

The following graduations are announced:—

DOCTOR OF VETERINARY SCIENCE

Thomas Edward Gibson.

MASTER OF VETERINARY SCIENCE

Rendle Lomax Cornwell.

DEGREE OF B.V.SC. WITH HONOURS

Class II: William Maurice Allen.

ORDINARY DEGREE OF B.V.SC.

Anthony Felix Batty, Thomas Keith Capron, Anthony Trevor Chesworth, Brian Harold Dawkes, John David Delme Edwards, William Elvey Sior Evans, Colin Fell, Kwame Obeng Gyening, Barrug Desmond Walker Hardy, Harold Jeffrey Holt, David Lea Hopkins, Gareth Wyn Jones, Ronald Samuel Jones, John Keith Miller, Nigel Andrew Milner, David Robert Peel, Pamela Pickup, George Procter, John Philip Rigby, Brian John Shreeve, Kevin Christopher Taylor, John Keith Thomas, Alwyn Vaughan, David Walker, John Michael Walker, and Paul Adrian Zagni.

DEGREE OF B.V.SC., FIRST EXAMINATION

PART I (CHEMISTRY)

Byrne, D. J., Charnock, M., Chew, P., Clement, J. E., Cross, Janet A. H., Davies, J. A., Duckworth, R. H., Edginton, A. B., Evans, G. R. E., Evans, M. H. D., Fasawe, T. C. K., Fox, R. I., Frith, Margaret, Gough, P. J., Hennessey, Marie C., Holness, Sheila, Jones, D. E., Lawson, J. B., Lee, R., Mann, J. A., Metcalfe, D. T., Parsons, G. A. T., Price, D. L., Stocks, A. G. H., Thomas, G. J. S., Topping, A. R., Wade, A J., and Wiggett, I.

PART II (PHYSICS)

Byrne, D. J., Charnock, M., Chew, P., Clement, J. E., Cross, Janet A. H., Dolan, M. S., Duckworth, R. H., Edginton, A. B., Evans, M. H. D., Fasawe, T. C. K., Fox, R. I., Frith, Margaret, Gough, P. J., Hennessey, Marie C., Holness, Sheila, Jones, D. E., Lawson, J. B., Lee, R., Mann, J. A., Metcalfe, D. T., Parsons, G. A. T., Price, D. L., Stocks, A. G. H., Terry, J. E., Thomas, G. J. S., Topping, A. R., Wade, A. J., and Wiggett, I.

PART III (BOTANY)

Bairds, J. M., Byrne, D. J., Charnock, M., Chew, P., Clement, J. E., Cross, Janet A. H., Davies, J. A., Dolan, M. S., Duckworth, R. H., Edginton, A. B., Evans, G. R. E., Evans, M. H. D., Fasawe, T. C. K., Fox, R. I., Frith, Margaret, Gough, P. J., Hennessey, Marie C., Holness, Sheila, Jones, D. E., Lawson, J. B., Lee, R., Mann, J. A., Metcalfe, D. T., Parsons, G. A. T., Price, D. L., Stocks, A. G. H., Terry, J. E., Thomas, G. J. S., Topping, A. R., Wade, A. J., and Wiggett, I.

PART IV (ZOOLOGY)

Evans, G. R. E.

DEGREE OF B.V.SC., THIRD EXAMINATION

PART I (PHARMACOLOGY)

Aldridge, Margaret C., Bardgett, P. L., Bradley, W. A., Davies, G. E. G., Entwistle, M. P., Fabry, A., Gardner, W. B., Gooderham, K. R., Hall, Elizabeth, Hardy, Elizabeth A., Hilton, D. W., Jones, R. T., Llewellyn, C. A., Llewellyn, G., Mohammed, I., Moore, J. C., Mudd, A. J., Newcomb, R., Pulley, Norma M., Rawson, B. C., Riffkin, G. G., *Sopranofalvy, M. J., Strong, M. G., Summers, D., Taylor, J. K., Williams, H. G., and Williams, M. H.

* Passed with distinction.

PASSED FINAL EXAMINATION (PART I) ONLY

Davies, J. O.

PASSED FINAL EXAMINATION (PART II) ONLY

Fitton, M. W., Zanetti, P. J.

R.V.C.'S NEW EXPERIMENTAL UNIT

A new experimental broiler unit, which will carry out experiments on variations of environment on performance, has been built at the Royal Veterinary College's farm at Potter's Bar. The building was donated to the College by S. Wernick & Sons Ltd., and other manufacturers have given equipment.

The experiments are being conducted by the Animal Husbandry Department of the College, and the main emphasis of the programme is the study of growth rate, food conversion and mortality figures.

PERSONAL

Mr. S. L. Hignett, President of the B.V.A., and Mr. Burden, Member of Parliament for Gillingham, have been invited to visit Holland to obtain first-hand information about new developments in veal production.

Mr. H. Dawes, C.B.E., has been elected President of the Hackney Horse Society. It is believed that this is the first time a veterinary surgeon has been elected to this office.

Births

ARCHBOLD.—On June 23rd, 1960, at Lisburn, Co. Antrim, to Jane (*née* Jackson) and Carson Archbold, MS.R.C.V.S., a daughter.

COLLYNS.—To Addesin and David Collyns, a daughter, Penelope Anne, on June 8th, 1960, at Takaha, Nelson, New Zealand.

NICHOLSON.—On June 30th, 1960, to Wendy (*née* Armitage), wife of Graeme Nicholson, B.V.M.S., M.R.C.V.S., 27, Tiln Road, Retford, Notts., a son, Alistair George.

NOORDIN KELING.—On June 27th, 1960, to Anne Salmiah, wife of Mohamad Noordin Keling, G.V.SC., M.R.C.V.S., D.T.V.M. (EDIN.), at Bungsar Hospital, Kuala Lumpur, Malaya, a son.

Marriage

MATHIESON—ELLIOT.—In the Barony Church, Alyth, on Tuesday, June 28th, 1960, at 2.30 p.m., Andrew Ogilvie Mathieson, B.V.M.S., of Laurencekirk, to Helen Weir Elliot of Smiddyhill, Alyth, Perthshire.

Obituary

GOOCH.—On June 23rd, 1960, Amy, beloved wife of Henry Gooch, M.R.C.V.S., of Lutterworth, Rugby, late Chief Superintending Inspector, Ministry of Agriculture and Fisheries.

We record with regret the death, in a Dublin hospital on June 29th, of Nora Helen, widow of Professor J. F. Craig, M.A., F.R.C.V.S. The late Mrs. Craig will be remembered, especially by the more senior members of the veterinary profession, as a lady who very rarely missed being present, with her husband, at the Annual Congresses of the then National Veterinary Medical Association, and she will be particularly remembered for her hospitality at the Congress in Belfast in 1935 when Professor Craig was President of the Association.

R.C.V.S. OBITUARY

We record with regret the death of the following member of the profession:—

CROSS, Henry Eustace, A.SC., D.V.H., Lucas House, Goff's Oak, Herts., late I.V.S., Captain late R.A.V.C. Graduated May 19th, 1904, at the New Edinburgh Veterinary College. Died March 20th, 1960.

COMING EVENTS

July

13th (Wed.). Summer Meeting of the Lancashire Veterinary Association at the University of Liverpool Veterinary Field Station, "Leahurst," Neston, 2.30 p.m. Dinner at the Hotel Victoria, Heswall, 7 p.m.

The summer meeting of the Mid-West Veterinary Association will be held at the Limpley Stoke Hotel, Limpley Stoke, 7.45 a.m.

Annual General Meeting of the Animal Diseases Research Association, Moredun Institute, Gilmerton, Edinburgh, 9, 3 p.m.

14th (Thurs.). Summer meeting of Northern Region Association of Veterinary Teachers & Research Workers at Sutton Bonnington, 11.30 a.m.

29th (Fri.). Meeting of the Yorkshire Veterinary Society in the Royal Station Hotel, York, at 2.30 p.m.

August 28th to September 3rd. 78th Annual Congress of the British Veterinary Association in Glasgow.

B.V.A. COMMITTEE AND COUNCIL MEETINGS IN LONDON, JULY, 1960

Tuesday, July 19th, at 7, Mansfield Street
Finance Sub-Committee.

Wednesday, July 20th, at 7, Mansfield Street
10 a.m. Farm Livestock Committee.
11.30 a.m. Home Appointments Committee.
2.15 p.m. Veterinary State Medicine Committee.
4 p.m. Parliamentary and Public Relations Committee.

Thursday, July 21st, at 7, Mansfield Street
10.30 a.m. Small Animals Committee.
2.15 p.m. General Purposes and Finance Committee.

Friday, July 22nd
10.15 a.m. Council Meeting in the Great Hall of the Royal Veterinary College, Camden Town, N.W.1.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Kirkcudbright. Fauld O'Wheat Farm, Balmaclellan (July 1).
Staffs. Brancote Farm, Tixall (June 29).

Fowl Pest

Essex. 576, Rayleigh Road, Hutton, Brentwood (June 30); Lyntondale, London Road, Billericay; Adare, Harts Lane, Arleigh, Colchester (July 2).
Lincs. Bleasby House Farm, Legsby, Market Rasen (June 28); No. 23 Mainwaring Allotments (June 29); Hill Top Farm, Lissington (June 30); Plots 68, 71 and 72 Canwick Fen Allotments (July 1).
Northants. Recketts & Coleman Bungalow, Foxcovert Road, Warrington, Peterborough (July 1).
Salop. Quarry Farm, Cefn Einon, Bishops Castle (July 1); Birches Mill, Clun, Craven Arms (July 2).
Suffolk. Larges Farm, Belchamp Walter, Sudbury (July 2).

Swine Fever

Ches. Manor Farm; Norton, Runcorn (July 4).
Denbigh. Coedy Farm, Overton, Wresham (July 1).
Devon. Lower Weaver, Plymtree, Cullompton (July 1).
Hereford. The Bakery, 44, Bye Street, Ledbury (June 30); Sandpits, Bromsberrow Heath, Ledbury (July 1).
Hunts. Worlick Farm, Ramsey (July 4).
Lancs. Edenfield Farm, Goosnargh, Preston (June 28); Mytton Fold Farm, Langho, Blackburn (June 29); Moss Cottage Farm, Moss Lane, Catforth, Preston (June 30); Clifton Trees Farm, Salwick, Kirkham, Preston (July 1); Deerhouse Farm, Gisburn, Clitheroe; Poulton View Farm, Carleton, Blackpool (July 4).
Lincs. Carr Farm, Grammar School Road, Brigg; Barn Farm, Wragby; Bardney Road Farm, Wragby (July 1).
Norfolk. "Kiora," Brancaster Staithe, King's Lynn (June 30); Church Farm, Scarning, Dereham (July 4).
Northants. St. Guthlacs Lodge, Postland, Crowland, Peterborough (July 4).
Somerset. Lower Farm, Milton Clevedon, Shepton Mallet (June 28); West End Farm, Street (June 29).
Worcs. Two Acres, Enville Road, Kinver, Stourbridge (June 28); Brickwalls Farm, Gilberts End, Hanley Castle; Church End Farm, Queenhill, Upton-on-Severn (July 1).
Yorks. Yew Tree Farm, West Marton, Skipton (June 28).

Letters to the Editor

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

SCIENTIFIC

Toxaphene Resistance in the Red Tick, *Rhipicephalus evertsi*, Neumann in South Africa

Sir,—Resistance to insecticides in several species of ticks is not a new phenomenon. In Africa insecticide resistance has, until the present, been confined to a single species, *Boophilus decoloratus*, Koch. Strains of *B. decoloratus* (the blue tick) have been shown to have developed resistance consecutively to sodium arsenite, BHC and related compounds and DDT (Whitehead, 1959). In many areas of Africa the blue tick forms only a part of a complex of a variety of tick species against which regular control measures are practised. In spite of this, however, resistance has always developed only in populations of the blue tick.

Early in 1959 it was observed that cattle dipped at weekly intervals in a 0.25 per cent. toxaphene wash on a farm, "Tayside," in the East London district, South Africa, were more heavily infested with red ticks, *Rhipicephalus evertsi*, Neumann, than might have been expected from past experience. The toxaphene concentration in the dipping tank was chemically checked and found to be up to strength.

Fully engorged female red ticks were collected from cattle at "Tayside" and compared with red ticks from the farm "Riverdale" where toxaphene was observed to be completely effective in the field. The laboratory method used for comparing the "Tayside" and "Riverdale" strains of red tick was similar to that used for blue ticks (Whitnall & Bradford, 1947). The results of these tests are presented in Table I.

TABLE I

THE EFFECT OF DIFFERENT CONCENTRATIONS OF TOXAPHENE ON "TAYSIDE" AND "RIVERDALE" ADULT FEMALE RED TICKS

Treatment	Percentage ticks which failed to produce viable eggs	
	"Riverdale" Red Ticks	"Tayside" Red Ticks
Toxaphene 0.25%	91.4	25
Toxaphene 0.5%	100	30
Toxaphene 1.0%	90	60

These results indicated a marked difference in response to toxaphene between the 2 strains of adult red ticks.

Larvae bred in the laboratory from "Tayside" and "Frankenwald" adult red ticks were also examined. The laboratory method used was similar to that for blue tick larvae (Whitehead, 1958). From the dosage response curve obtained with "Frankenwald" red tick larvae the LC 50 value was 0.953 per cent. toxaphene. Under similar conditions using the highest practical concentrations of toxaphene 50 per cent. mortality of "Tayside" red tick larvae could not be obtained.

A concentration of 0.08 per cent. toxaphene gave only 1.7 per cent. mortality and 5.12 per cent. toxaphene only 6 per cent. These results indicate a degree of tolerance in a large proportion of "Tayside" red tick larvae which for practical purposes resulted in a complete immunity to toxaphene.

This appears to be the first record of insecticide resistance in a "two-host" species of tick in Africa. The concomitant tolerance of this strain to BHC and Dieldrin together with its behaviour to DDT, "Delnav," sodium arsenite and "Sevin" were also investigated. Details of this work will be published elsewhere.

Yours faithfully,

G. B. WHITEHEAD.
African Explosives and Chemical Industries Limited,
P.O. Box 1122,
Johannesburg.

J. A. F. BAKER.
Cooper and Nephews S. Afr. (Proprietary) Limited,
P.O. Box 2963,
Johannesburg.

June 24th, 1960.

References

WHITEHEAD, G. B. (1958). *Bull. ent. Res.* **49**. 661.
———. (1959). *J. S. Afr. vet. med. Ass.* **30** (3). 221.
WHITNALL, A. B. M., & BRADFORD, B. (1947). *Bull. ent. Res.* **38**. 207.

GENERAL

Phenazocine* as an Analgesic in the Dog

In reporting the following experiences with phenazocine (2'-hydroxy-5, 9-dimethyl-2-phenethyl-6, 7-benzomorphan hydrobromide), the synthesis of which was first reported by May and Eddy (1959), we acknowledge that they are parallel to further and more extensive trials being carried out elsewhere (Weaver, 1960). It was thought, however, that they would be of interest to readers.

Eckenhoff (1959) reported that phenazocine was effective as an analgesic in human patients when given intramuscularly in the range of 0.5 to 3.0 mg. At the 1.5 mg. dose he estimated a 94 per cent. effectiveness in relieving immediate post-operative pain or restlessness.

Wendel, Shemano and Ross (1959) estimated the analgesic effect in the dog as 14 times that of morphine. In unpublished studies in this country in which one of us (R. L. B.) has participated, it has been confirmed that doses of up to 4 mg. per kg. bodyweight do not produce vomiting in the dog.

The present report deals with 8 clinical studies. 7 of which were cases where phenazocine was used

* Narphen: Smith & Nephew Pharmaceuticals Ltd.

during operation and one case where phenazocine was used both during operation and post-operatively.

In 7 bitches of varied species, aged between 7 and 10 years and weighing from 40 to 55 lb., laparotomies were performed using minimal anaesthesia (Vallergan/Nembutal). At the terminal stages of these operations restlessness was observed, sufficient to interfere with suturing. At this stage 0.5 to 1.0 mg. phenazocine was administered intravenously and within 5 minutes it was, in each case, possible to continue without further recourse to therapy. No respiratory depression or vomiting resulted, and each patient appeared free from post-operative discomfort without further sedation or analgesia.

In one case, a boxer bitch of 7 years, weighing 55 lb., a fibroma involving the complete wall of the vagina was removed. Anaesthesia was carried out using 50 mg. Largactil intravenously and 7 ml. Nembutal intravenously. During the operation, which lasted an hour, there was extensive haemorrhage. In the latter stages, whilst the vessels were being ligated, restlessness developed. At this point 1.5 mg. phenazocine was given intravenously by the sublingual vein. Four hours after the operation signs of restlessness reappeared, and a further 1.5 mg. was administered intravenously. The patient made an uneventful recovery without further analgesia or sedation. No respiratory depression or vomiting occurred.

In the post-operative use of phenazocine in the foregoing cases, there appeared to be adequate analgesia without appreciable sedation. In the light of these early results it would appear that phenazocine should prove a useful drug in the relief of acute pain in the dog, exempt from the side-effects which generally accompany the use of morphine.

Yours faithfully,
H. G. GILES,
R. L. BURCH.

11, Belsize Terrace,
Hampstead, N.W.3.
June 28th, 1960.

ECKENHOFF, J. E. (1959). *Anaesthiology*. **20**. 355.
MAY, E. L., & EDDY, N. B. (1959). *J. Org. Chem.* **24**. 294.
WEAVER, A. D. (1960). Private communication.
WENDEL, H., SHEMANO, L., & ROSS, S. D. (1959). *Pharmacologist*. **1**. 78.

A New Type of Splint

Sir,—Recently I visited the veterinary clinic of the Free University of Berlin. There I had opportunity to see a little of the work of the Director of this field station, Dr. Becker. He has devised a splint which in principle is very similar to the Kirschner-Ehmer and Stader splints in that reduction is accomplished without exposure of the fracture site. Pins are screwed into the substance of the bone on either side of the fracture site. After reduction these pins are held in place by embedding them in a plastic material which is moulded whilst wet. Like plaster of Paris this plastic quickly dries and sets hard to act in the same way as the extensor bar of the Stader splint. To my mind the disadvantage of being unable to adjust this bar is outweighed by the advantages of strength and lightness. There is less chance of distortion of the bone in small light-boned dogs than with the other two types of splint. The plastic material used can be used also in the same way as plaster of Paris either alone or impregnated in bandages to form a cast. Such a cast is lighter and stronger than a similar one made from plaster of Paris. The drawback to this material at present is its cost.

Dr. Becker's work is an example of how the veterinary profession sometimes has something to offer the medical profession. Already this splint has been successfully used in human surgery particularly in cases such as fracture of the lower jaw. Not only does it reduce the recovery time but the patient is able to eat within two or three days of the operation.

Yours faithfully,
R. B. HEARNE.

1 War Dog Training Unit,
British Forces Post Office 16.
June 26th, 1960.

Professional Fees

Sir,—In view of the widespread interest shown recently in the profession in the possibility of setting up a scale of fees and thus producing some sort of order out of chaos, the following observation may be of interest, though, I fear, of no value.

During the many years I was in practice, I remained convinced that my charges were far lower than those of my neighbours, and wondered enviously how they got away with it, curse them! But since travelling about and seeing a good many practices from the inside, I find that *all* veterinary surgeons suffer from this same illusion—if it be an illusion.

So what?

Yours faithfully,
PAUL CROSFIELD.

Little Tew,
Oxford.
June 28th, 1960.

"Clinics for the Cows"

Sir,—I can only hope that in this year of grace, 1960, there are not many other colleagues who look at veterinary problems and veterinary life with the same spinsterish trepidation as Mr. Barrett, for then one will be forced to the shameful admission that the veterinary profession is "static and dangerously complacent." How can Mr. Barrett boast proudly that our profession is composed of men and women of divergent, independent thought, loving freedom in all respects and then deny a member his right to exercise these civilised attributes?

For Mr. Barrett's information, 1. I regret that I have no hospital or clinic for the occasional large animal. 2. I am thankful that T.T. is part of a national effort along with other Ministry of Agriculture enterprises. 3. I am not embarrassed by a colleague whose views differ from mine, but I am embarrassed when an L.V.I. who, in process of swine fever investigations, informs a client of mine that he will, or does, vaccinate pigs at 4s. per head. 4. In my opinion the nationalised medical service is of

tremendous value to the profession and the community, and any shortcomings are the result of the medical profession's inability to orientate itself logically at the inception of nationalisation. Similarly, a nationalised veterinary service may be of great value to the profession and the community if the profession approaches the matter with cold-blooded reason as it would any scientific problem.

Finally, I would suggest that the principal of the large-animal clinic be requested to publish an article in THE RECORD for the edification of the profession, for I have no doubt that much important, practical material would be forthcoming.

Yours faithfully,
J. CASSELLS.

141, Tettenhall Road,
Wolverhampton.
July 4th, 1960.

Lymphatic Leucosis of Dogs

Sir,—We have read with interest the letter by Mr. Owen and subsequent comments by Miss Joshua and by Mr. Clover referring to cases of lymphatic leucosis which showed dramatic temporary regression following removal of a lymph node, blood transfusions, and cortisone therapy.

We have attempted to treat a small number of similar cases using cortisone and cytotoxic agents. We hope to present a full report of our results in the near future but it seemed worth while to comment briefly on our findings.

Six cases were treated, and 5 of these showed bilateral enlargement of lymph nodes when first examined. The sixth case at first examination had 2 small mammary tumours and an inguinal hernia, but when further examined under general anaesthesia an enlarged spleen was palpated. Ten days after this examination generalised enlargement of lymph nodes was noticed.

The dogs were all given initial doses of cortisone acetate (10 to 25 mg.) by intramuscular injection. This resulted in a general improvement in each case, but in only 2 dogs was there any reduction in the size of lymph nodes. The regression was small and persisted for only a few days. Three dogs were subsequently treated with triethanomelamine* 2.5 mg. daily for 3 days. This was followed by marked regression in the size of lymph nodes lasting up to 6 weeks but a second course of the drug had no effect on the size of the re-enlarged glands. A fourth dog received chlorambucil† orally 1 mg. daily for 8 days without noticeable improvement.

All cases eventually showed severe anaemia with low R.B.C. counts and haemoglobin levels but only 2 had W.B.C. counts above 20,000. The white cell counts returned to normal following treatment with cortisone or with cortisone and triethanomelamine. Anaemia in 2 dogs was treated by blood transfusions but these did not prevent continued deterioration although the fall in red cell count was temporarily halted.

Lymph node biopsy was carried out in one case under local anaesthesia. This was not followed by any amelioration of symptoms.

The 6 dogs were ultimately destroyed at the request of their owners but the reason for destruction was different in each case. One dog had difficulty in feeding and ultimately in respiration due to massive enlargement of the lymph nodes in the neck. In 2 others the enlarged lymph nodes in the thoracic cavity led to oedema with respiratory and cardiac embarrassment, whilst in the other 3 the invasion of liver, spleen and kidney by lymphoid tissue led to a general deterioration in the condition. The action of the cytotoxic agent triethanomelamine was only temporary, and many cases eventually became resistant to the drug; furthermore, triethanomelamine has a small safety margin and cannot be given continuously.

These limited experiences give little hope for successful therapy by the use of cytotoxic agents. The writers are unaware of any case which showed complete spontaneous regression although untreated cases sometimes survived for several months. In general, however, our experiences with cortisone would support the view of Miss Joshua that temporary improvement is due to suppression of symptoms rather than to a direct affect on lymphoid tissue. It may be that the doses we used were not sufficient to produce the latter effect.

Yours faithfully,
J. SANFORD.

Department of Veterinary Pharmacology,
Veterinary Hospital,
University of Glasgow.

MARY C. B. O'MALLEY.

Veterinary Hospital,
University of Liverpool.
June 30th, 1960.

* T.E.M. (I.C.I.).
† Leukeran (Burroughs Wellcome & Co.).

Cystic Calculi in the Cat

Sir,—Mr. Jarvis's interesting communication on cystic calculi in the cat prompts me very briefly to record 2 cases which I recently encountered. I think they may be of interest in view of the fact—noted by Mr. Jarvis—that the majority of recorded cases have been in spayed females or castrated males.

The first case was that of an entire male cat under one year old. The calculus, which was readily palpable, was a smooth, hard crystalline disc measuring 27 × 25 × 12 mm.

The second case was of an unspayed female about 10 years old. No calculi were palpable but diagnosis was made on the symptoms of chronic cystitis. In this case the bladder wall was grossly thickened and 4 small, roughly stellate calculi, approximately a quarter of an inch in diameter, were removed.

Yours faithfully,
J. B. SUTTON.

2, Friarswood Road,
Newcastle under Lyme,
Staffs.
June 30th, 1960.